C2_W3_Assignment

September 5, 2023

1 Practice Lab: Advice for Applying Machine Learning

In this lab, you will explore techniques to evaluate and improve your machine learning models.

2 Outline

NOTE: *To prevent errors from the autograder, you are not allowed to edit or delete non-graded cells in this notebook . Please also refrain from adding any new cells.* **Once you have passed this assignment** *and want to experiment with any of the non-graded code, you may follow the instructions at the bottom of this notebook.*

1 - Packages

First, let's run the cell below to import all the packages that you will need during this assignment. - numpy is the fundamental package for scientific computing Python. - matplotlib is a popular library to plot graphs in Python. - scikitlearn is a basic library for data mining - tensorflow a popular platform for machine learning.

```python
[1]: import numpy as np
     %matplotlib widget
     import matplotlib.pyplot as plt
     from sklearn.linear_model import LinearRegression, Ridge
     from sklearn.preprocessing import StandardScaler, PolynomialFeatures
     from sklearn.model_selection import train_test_split
     from sklearn.metrics import mean_squared_error
     import tensorflow as tf
     from tensorflow.keras.models import Sequential
     from tensorflow.keras.layers import Dense
     from tensorflow.keras.activations import relu,linear
     from tensorflow.keras.losses import SparseCategoricalCrossentropy
     from tensorflow.keras.optimizers import Adam

     import logging
     logging.getLogger("tensorflow").setLevel(logging.ERROR)

     from public_tests_a1 import *

     tf.keras.backend.set_floatx('float64')
     from assigment_utils import *

     tf.autograph.set_verbosity(0)
```

2 - Evaluating a Learning Algorithm (Polynomial Regression)

Let's say you have created a machine learning model and you find it *fits* your training data very well. You're done? Not quite. The goal of creating the model was to be able to predict values for *new* examples.

How can you test your model's performance on new data before deploying it?
The answer has two parts: * Split your original data set into "Training" and "Test" sets. * Use the training data to fit the parameters of the model * Use the test data to evaluate the model on *new* data * Develop an error function to evaluate your model.

2.1 Splitting your data set Lectures advised reserving 20-40% of your data set for testing. Let's use an `sklearn` function train_test_split to perform the split. Double-check the shapes after running the following cell.

```python
[2]: # Generate some data
     X,y,x_ideal,y_ideal = gen_data(18, 2, 0.7)
     print("X.shape", X.shape, "y.shape", y.shape)

     #split the data using sklearn routine
```

```
X_train, X_test, y_train, y_test = train_test_split(X,y,test_size=0.33,␣
  ↪random_state=1)
print("X_train.shape", X_train.shape, "y_train.shape", y_train.shape)
print("X_test.shape", X_test.shape, "y_test.shape", y_test.shape)
```

```
X.shape (18,) y.shape (18,)
X_train.shape (12,) y_train.shape (12,)
X_test.shape (6,) y_test.shape (6,)
```

2.1.1 Plot Train, Test sets   You can see below the data points that will be part of training (in red) are intermixed with those that the model is not trained on (test). This particular data set is a quadratic function with noise added. The "ideal" curve is shown for reference.

[3]:
```
fig, ax = plt.subplots(1,1,figsize=(4,4))
ax.plot(x_ideal, y_ideal, "--", color = "orangered", label="y_ideal", lw=1)
ax.set_title("Training, Test",fontsize = 14)
ax.set_xlabel("x")
ax.set_ylabel("y")

ax.scatter(X_train, y_train, color = "red",          label="train")
ax.scatter(X_test, y_test,   color = dlc["dlblue"],  label="test")
ax.legend(loc='upper left')
plt.show()
```

```
Canvas(toolbar=Toolbar(toolitems=[('Home', 'Reset original view', 'home', 'home'), ('Back', 'Ba
```

2.2 Error calculation for model evaluation, linear regression When *evaluating* a linear regression model, you average the squared error difference of the predicted values and the target values.

$$J_{\text{test}}(\mathbf{w}, b) = \frac{1}{2m_{\text{test}}} \sum_{i=0}^{m_{\text{test}}-1} (f_{\mathbf{w},b}(\mathbf{x}_{\text{test}}^{(i)}) - y_{\text{test}}^{(i)})^2 \tag{1}$$

Exercise 1

Below, create a function to evaluate the error on a data set for a linear regression model.

[6]:
```
# UNQ_C1
# GRADED CELL: eval_mse
def eval_mse(y, yhat):
    """
    Calculate the mean squared error on a data set.
    Args:
      y    : (ndarray  Shape (m,) or (m,1))  target value of each example
      yhat : (ndarray  Shape (m,) or (m,1))  predicted value of each example
    Returns:
```

```
          err: (scalar)
      """
      m = len(y)
      err = 0.0
      for i in range(m):
          err_i  = ( (yhat[i] - y[i])**2 )
          err    += err_i
      err = err / (2*m)
      return(err)
```

[7]:
```
y_hat = np.array([2.4, 4.2])
y_tmp = np.array([2.3, 4.1])
eval_mse(y_hat, y_tmp)

# BEGIN UNIT TEST
test_eval_mse(eval_mse)
# END UNIT TEST
```

All tests passed.

Click for hints

```
def eval_mse(y, yhat):
    """
    Calculate the mean squared error on a data set.
    Args:
      y     : (ndarray  Shape (m,) or (m,1))  target value of each example
      yhat  : (ndarray  Shape (m,) or (m,1))  predicted value of each example
    Returns:
      err: (scalar)
    """
    m = len(y)
    err = 0.0
    for i in range(m):
        err_i  = ( (yhat[i] - y[i])**2 )
        err    += err_i
    err = err / (2*m)
    return(err)
```

2.3 Compare performance on training and test data Let's build a high degree polynomial model to minimize training error. This will use the linear_regression functions from sklearn. The code is in the imported utility file if you would like to see the details. The steps below are: * create and fit the model. ('fit' is another name for training or running gradient descent). * compute the error on the training data. * compute the error on the test data.

[8]:
```
# create a model in sklearn, train on training data
degree = 10
lmodel = lin_model(degree)
lmodel.fit(X_train, y_train)
```

```python
# predict on training data, find training error
yhat = lmodel.predict(X_train)
err_train = lmodel.mse(y_train, yhat)

# predict on test data, find error
yhat = lmodel.predict(X_test)
err_test = lmodel.mse(y_test, yhat)
```

The computed error on the training set is substantially less than that of the test set.

```
[9]: print(f"training err {err_train:0.2f}, test err {err_test:0.2f}")
```

```
training err 58.01, test err 171215.01
```

The following plot shows why this is. The model fits the training data very well. To do so, it has created a complex function. The test data was not part of the training and the model does a poor job of predicting on this data.
This model would be described as 1) is overfitting, 2) has high variance 3) 'generalizes' poorly.

```
[10]: # plot predictions over data range
x = np.linspace(0,int(X.max()),100)   # predict values for plot
y_pred = lmodel.predict(x).reshape(-1,1)

plt_train_test(X_train, y_train, X_test, y_test, x, y_pred, x_ideal, y_ideal,␣
 ↪degree)
```

```
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```

The test set error shows this model will not work well on new data. If you use the test error to guide improvements in the model, then the model will perform well on the test data... but the test data was meant to represent *new* data. You need yet another set of data to test new data performance.

The proposal made during lecture is to separate data into three groups. The distribution of training, cross-validation and test sets shown in the below table is a typical distribution, but can be varied depending on the amount of data available.

data	% of total	Description
training	60	Data used to tune model parameters w and b in training or fitting

data	% of total	Description
cross-validation	20	Data used to tune other model parameters like degree of polynomial, regularization or the architecture of a neural network.
test	20	Data used to test the model after tuning to gauge performance on new data

Let's generate three data sets below. We'll once again use `train_test_split` from `sklearn` but will call it twice to get three splits:

```python
[11]:  # Generate  data
       X,y, x_ideal,y_ideal = gen_data(40, 5, 0.7)
       print("X.shape", X.shape, "y.shape", y.shape)

       #split the data using sklearn routine
       X_train, X_, y_train, y_ = train_test_split(X,y,test_size=0.40, random_state=1)
       X_cv, X_test, y_cv, y_test = train_test_split(X_,y_,test_size=0.50,
        ↪random_state=1)
       print("X_train.shape", X_train.shape, "y_train.shape", y_train.shape)
       print("X_cv.shape", X_cv.shape, "y_cv.shape", y_cv.shape)
       print("X_test.shape", X_test.shape, "y_test.shape", y_test.shape)
```

```
X.shape (40,) y.shape (40,)
X_train.shape (24,) y_train.shape (24,)
X_cv.shape (8,) y_cv.shape (8,)
X_test.shape (8,) y_test.shape (8,)
```

3 - Bias and Variance Above, it was clear the degree of the polynomial model was too high. How can you choose a good value? It turns out, as shown in the diagram, the training and cross-validation performance can provide guidance. By trying a range of degree values, the training and cross-validation performance can be evaluated. As the degree becomes too large, the cross-validation performance will start to degrade relative to the training performance. Let's try this on our example.

3.1 Plot Train, Cross-Validation, Test You can see below the datapoints that will be part of training (in red) are intermixed with those that the model is not trained on (test and cv).

```python
[12]:  fig, ax = plt.subplots(1,1,figsize=(4,4))
       ax.plot(x_ideal, y_ideal, "--", color = "orangered", label="y_ideal", lw=1)
       ax.set_title("Training, CV, Test",fontsize = 14)
       ax.set_xlabel("x")
```

```
ax.set_ylabel("y")

ax.scatter(X_train, y_train, color = "red",              label="train")
ax.scatter(X_cv, y_cv,        color = dlc["dlorange"], label="cv")
ax.scatter(X_test, y_test,    color = dlc["dlblue"],   label="test")
ax.legend(loc='upper left')
plt.show()
```

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3.2 Finding the optimal degree In previous labs, you found that you could create a model capable of fitting complex curves by utilizing a polynomial (See Course1, Week2 Feature Engineering and Polynomial Regression Lab). Further, you demonstrated that by increasing the *degree* of the polynomial, you could *create* overfitting. (See Course 1, Week3, Over-Fitting Lab). Let's use that knowledge here to test our ability to tell the difference between over-fitting and under-fitting.

Let's train the model repeatedly, increasing the degree of the polynomial each iteration. Here, we're going to use the scikit-learn linear regression model for speed and simplicity.

```
[13]: max_degree = 9
      err_train = np.zeros(max_degree)
      err_cv = np.zeros(max_degree)
      x = np.linspace(0,int(X.max()),100)
      y_pred = np.zeros((100,max_degree))  #columns are lines to plot

      for degree in range(max_degree):
          lmodel = lin_model(degree+1)
          lmodel.fit(X_train, y_train)
          yhat = lmodel.predict(X_train)
          err_train[degree] = lmodel.mse(y_train, yhat)
          yhat = lmodel.predict(X_cv)
          err_cv[degree] = lmodel.mse(y_cv, yhat)
          y_pred[:,degree] = lmodel.predict(x)

      optimal_degree = np.argmin(err_cv)+1
```

Let's plot the result:

```
[14]: plt.close("all")
      plt_optimal_degree(X_train, y_train, X_cv, y_cv, x, y_pred, x_ideal, y_ideal,
                         err_train, err_cv, optimal_degree, max_degree)
```

Canvas(toolbar=Toolbar(toolitems=[('Home', 'Reset original view', 'home', 'home'), ('Back', 'B

The plot above demonstrates that separating data into two groups, data the model is trained on and data the model has not been trained on, can be used to determine if the model is underfitting or overfitting. In our example, we created a variety of models varying from underfitting to overfitting

by increasing the degree of the polynomial used. - On the left plot, the solid lines represent the predictions from these models. A polynomial model with degree 1 produces a straight line that intersects very few data points, while the maximum degree hews very closely to every data point. - on the right: - the error on the trained data (blue) decreases as the model complexity increases as expected - the error of the cross-validation data decreases initially as the model starts to conform to the data, but then increases as the model starts to over-fit on the training data (fails to *generalize*).

It's worth noting that the curves in these examples as not as smooth as one might draw for a lecture. It's clear the specific data points assigned to each group can change your results significantly. The general trend is what is important.

3.3 Tuning Regularization. In previous labs, you have utilized *regularization* to reduce over-fitting. Similar to degree, one can use the same methodology to tune the regularization parameter lambda (λ).

Let's demonstrate this by starting with a high degree polynomial and varying the regularization parameter.

```
[15]: lambda_range = np.array([0.0, 1e-6, 1e-5, 1e-4,1e-3,1e-2, 1e-1,1,10,100])
      num_steps = len(lambda_range)
      degree = 10
      err_train = np.zeros(num_steps)
      err_cv = np.zeros(num_steps)
      x = np.linspace(0,int(X.max()),100)
      y_pred = np.zeros((100,num_steps))   #columns are lines to plot

      for i in range(num_steps):
          lambda_= lambda_range[i]
          lmodel = lin_model(degree, regularization=True, lambda_=lambda_)
          lmodel.fit(X_train, y_train)
          yhat = lmodel.predict(X_train)
          err_train[i] = lmodel.mse(y_train, yhat)
          yhat = lmodel.predict(X_cv)
          err_cv[i] = lmodel.mse(y_cv, yhat)
          y_pred[:,i] = lmodel.predict(x)

      optimal_reg_idx = np.argmin(err_cv)
```

```
[16]: plt.close("all")
      plt_tune_regularization(X_train, y_train, X_cv, y_cv, x, y_pred, err_train,␣
        ↪err_cv, optimal_reg_idx, lambda_range)
```

Canvas(toolbar=Toolbar(toolitems=[('Home', 'Reset original view', 'home', 'home'), ('Back', 'Ba

Above, the plots show that as regularization increases, the model moves from a high variance (overfitting) model to a high bias (underfitting) model. The vertical line in the right plot shows the optimal value of lambda. In this example, the polynomial degree was set to 10.

3.4 Getting more data: Increasing Training Set Size (m) When a model is overfitting (high

variance), collecting additional data can improve performance. Let's try that here.

```
[17]:  X_train, y_train, X_cv, y_cv, x, y_pred, err_train, err_cv, m_range,degree =␣
       ↪tune_m()
       plt_tune_m(X_train, y_train, X_cv, y_cv, x, y_pred, err_train, err_cv, m_range,␣
       ↪degree)
```

Canvas(toolbar=Toolbar(toolitems=[('Home', 'Reset original view', 'home', 'home'), ('Back', 'B

The above plots show that when a model has high variance and is overfitting, adding more examples improves performance. Note the curves on the left plot. The final curve with the highest value of m is a smooth curve that is in the center of the data. On the right, as the number of examples increases, the performance of the training set and cross-validation set converge to similar values. Note that the curves are not as smooth as one might see in a lecture. That is to be expected. The trend remains clear: more data improves generalization.

> Note that adding more examples when the model has high bias (underfitting) does not improve performance.

4 - Evaluating a Learning Algorithm (Neural Network) Above, you tuned aspects of a polynomial regression model. Here, you will work with a neural network model. Let's start by creating a classification data set.

4.1 Data Set Run the cell below to generate a data set and split it into training, cross-validation (CV) and test sets. In this example, we're increasing the percentage of cross-validation data points for emphasis.

```
[18]:  # Generate and split data set
       X, y, centers, classes, std = gen_blobs()

       # split the data. Large CV population for demonstration
       X_train, X_, y_train, y_ = train_test_split(X,y,test_size=0.50, random_state=1)
       X_cv, X_test, y_cv, y_test = train_test_split(X_,y_,test_size=0.20,␣
       ↪random_state=1)
       print("X_train.shape:", X_train.shape, "X_cv.shape:", X_cv.shape, "X_test.shape:
       ↪", X_test.shape)
```

X_train.shape: (400, 2) X_cv.shape: (320, 2) X_test.shape: (80, 2)

```
[19]:  plt_train_eq_dist(X_train, y_train,classes, X_cv, y_cv, centers, std)
```

Canvas(toolbar=Toolbar(toolitems=[('Home', 'Reset original view', 'home', 'home'), ('Back', 'B

Above, you can see the data on the left. There are six clusters identified by color. Both training points (dots) and cross-validataion points (triangles) are shown. The interesting points are those that fall in ambiguous locations where either cluster might consider them members. What would you expect a neural network model to do? What would be an example of overfitting? underfitting? On the right is an example of an 'ideal' model, or a model one might create knowing the source of

the data. The lines represent 'equal distance' boundaries where the distance between center points is equal. It's worth noting that this model would "misclassify" roughly 8% of the total data set.

4.2 Evaluating categorical model by calculating classification error The evaluation function for categorical models used here is simply the fraction of incorrect predictions:

$$J_{cv} = \frac{1}{m} \sum_{i=0}^{m-1} \begin{cases} 1, & \text{if } \hat{y}^{(i)} \neq y^{(i)} \\ 0, & \text{otherwise} \end{cases}$$

Exercise 2

Below, complete the routine to calculate classification error. Note, in this lab, target values are the index of the category and are not one-hot encoded.

```python
[20]: # UNQ_C2
# GRADED CELL: eval_cat_err
def eval_cat_err(y, yhat):
    """
    Calculate the categorization error
    Args:
      y    : (ndarray  Shape (m,) or (m,1))  target value of each example
      yhat : (ndarray  Shape (m,) or (m,1))  predicted value of each example
    Returns:|
      cerr: (scalar)
    """
    m = len(y)
    incorrect = 0
    for i in range(m):
        if yhat[i] != y[i]:      # @REPLACE
            incorrect += 1       # @REPLACE
    cerr = incorrect/m           # @REPLACE
    return(cerr)
```

```python
[21]: y_hat = np.array([1, 2, 0])
y_tmp = np.array([1, 2, 3])
print(f"categorization error {np.squeeze(eval_cat_err(y_hat, y_tmp)):0.3f},␣
 ↪expected:0.333" )
y_hat = np.array([[1], [2], [0], [3]])
y_tmp = np.array([[1], [2], [1], [3]])
print(f"categorization error {np.squeeze(eval_cat_err(y_hat, y_tmp)):0.3f},␣
 ↪expected:0.250" )

# BEGIN UNIT TEST
test_eval_cat_err(eval_cat_err)
# END UNIT TEST
```

```
categorization error 0.333, expected:0.333
categorization error 0.250, expected:0.250
 All tests passed.
```

Click for hints

```python
def eval_cat_err(y, yhat):
    """
    Calculate the categorization error
    Args:
      y    : (ndarray  Shape (m,) or (m,1))  target value of each example
      yhat : (ndarray  Shape (m,) or (m,1))  predicted value of each example
    Returns:|
      cerr: (scalar)
    """
    m = len(y)
    incorrect = 0
    for i in range(m):
        if yhat[i] != y[i]:     # @REPLACE
            incorrect += 1      # @REPLACE
    cerr = incorrect/m          # @REPLACE
    return(cerr)
```

5 - Model Complexity Below, you will build two models. A complex model and a simple model. You will evaluate the models to determine if they are likely to overfit or underfit.

2.0.1 5.1 Complex model

Exercise 3 Below, compose a three-layer model: * Dense layer with 120 units, relu activation * Dense layer with 40 units, relu activation * Dense layer with 6 units and a linear activation (not softmax)

Compile using * loss with `SparseCategoricalCrossentropy`, remember to use `from_logits=True` * Adam optimizer with learning rate of 0.01.

```python
[22]: # UNQ_C3
      # GRADED CELL: model
      import logging
      logging.getLogger("tensorflow").setLevel(logging.ERROR)

      tf.random.set_seed(1234)
      model = Sequential(
          [
              ### START CODE HERE ###
              Dense(120, activation='relu'),
              Dense(40, activation='relu'),
              Dense(6, activation='linear'),
              ### END CODE HERE ###


          ], name="Complex"
      )
      model.compile(
          ### START CODE HERE ###
```

11

```
      loss=tf.keras.losses.SparseCategoricalCrossentropy(from_logits=True),
      optimizer=tf.keras.optimizers.Adam(learning_rate=0.01),
      ### END CODE HERE ###
)
```

[23]:
```
# BEGIN UNIT TEST
model.fit(
    X_train, y_train,
    epochs=1000
)
# END UNIT TEST
```

```
Epoch 1/1000
13/13 [==============================] - 0s 2ms/step - loss: 1.1106
Epoch 2/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4281
Epoch 3/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3345
Epoch 4/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2896
Epoch 5/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2867
Epoch 6/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2918
Epoch 7/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2497
Epoch 8/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2298
Epoch 9/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2307
Epoch 10/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2071
Epoch 11/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2115
Epoch 12/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2070
Epoch 13/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2366
Epoch 14/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2261
Epoch 15/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2224
Epoch 16/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2055
Epoch 17/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2044
Epoch 18/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2006
Epoch 19/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2168
Epoch 20/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2047
Epoch 21/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2237
Epoch 22/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2497
Epoch 23/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2113
Epoch 24/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2025
Epoch 25/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2107
Epoch 26/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2000
Epoch 27/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1935
Epoch 28/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1963
Epoch 29/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2188
Epoch 30/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2424
Epoch 31/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1969
Epoch 32/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1950
Epoch 33/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1904
Epoch 34/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2173
Epoch 35/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2074
Epoch 36/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1768
Epoch 37/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1794
Epoch 38/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1733
Epoch 39/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1955
Epoch 40/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1870
Epoch 41/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2128
Epoch 42/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.1987
Epoch 43/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1895
Epoch 44/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2073
Epoch 45/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2148
Epoch 46/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1774
Epoch 47/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1886
Epoch 48/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1763
Epoch 49/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1769
Epoch 50/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1763
Epoch 51/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2020
Epoch 52/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1889
Epoch 53/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2035
Epoch 54/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1761
Epoch 55/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1838
Epoch 56/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1774
Epoch 57/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1953
Epoch 58/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1882
Epoch 59/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1860
Epoch 60/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1919
Epoch 61/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1848
Epoch 62/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1630
Epoch 63/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1616
Epoch 64/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2008
Epoch 65/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1936
Epoch 66/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.1824
Epoch 67/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2092
Epoch 68/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2287
Epoch 69/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1877
Epoch 70/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1716
Epoch 71/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1917
Epoch 72/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1703
Epoch 73/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1750
Epoch 74/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1836
Epoch 75/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1696
Epoch 76/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1542
Epoch 77/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1715
Epoch 78/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1545
Epoch 79/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1593
Epoch 80/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1844
Epoch 81/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1881
Epoch 82/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1696
Epoch 83/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1614
Epoch 84/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1762
Epoch 85/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1779
Epoch 86/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1658
Epoch 87/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1614
Epoch 88/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1639
Epoch 89/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1629
Epoch 90/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.1475
Epoch 91/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1452
Epoch 92/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1473
Epoch 93/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1490
Epoch 94/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1650
Epoch 95/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1706
Epoch 96/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1704
Epoch 97/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1764
Epoch 98/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1855
Epoch 99/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1685
Epoch 100/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1569
Epoch 101/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1645
Epoch 102/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1737
Epoch 103/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1935
Epoch 104/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1600
Epoch 105/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1483
Epoch 106/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1555
Epoch 107/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1678
Epoch 108/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1435
Epoch 109/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1419
Epoch 110/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1494
Epoch 111/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1538
Epoch 112/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1682
Epoch 113/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1687
Epoch 114/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.1436
Epoch 115/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1366
Epoch 116/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1485
Epoch 117/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1400
Epoch 118/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1357
Epoch 119/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1444
Epoch 120/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1403
Epoch 121/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1465
Epoch 122/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1549
Epoch 123/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1402
Epoch 124/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1337
Epoch 125/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1422
Epoch 126/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1560
Epoch 127/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1319
Epoch 128/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1389
Epoch 129/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1404
Epoch 130/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1299
Epoch 131/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1247
Epoch 132/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1244
Epoch 133/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1260
Epoch 134/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1158
Epoch 135/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1343
Epoch 136/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1306
Epoch 137/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1294
Epoch 138/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.1297
Epoch 139/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1342
Epoch 140/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1255
Epoch 141/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1232
Epoch 142/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1199
Epoch 143/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1192
Epoch 144/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1192
Epoch 145/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1342
Epoch 146/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1477
Epoch 147/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1780
Epoch 148/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1673
Epoch 149/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1402
Epoch 150/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1292
Epoch 151/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1296
Epoch 152/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1221
Epoch 153/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1300
Epoch 154/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1316
Epoch 155/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1274
Epoch 156/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1192
Epoch 157/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1266
Epoch 158/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1185
Epoch 159/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1197
Epoch 160/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1148
Epoch 161/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1137
Epoch 162/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.1427
Epoch 163/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1420
Epoch 164/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1327
Epoch 165/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1276
Epoch 166/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1099
Epoch 167/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1205
Epoch 168/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1307
Epoch 169/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1476
Epoch 170/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1673
Epoch 171/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1349
Epoch 172/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1183
Epoch 173/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1225
Epoch 174/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1276
Epoch 175/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1029
Epoch 176/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1134
Epoch 177/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1081
Epoch 178/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1245
Epoch 179/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1346
Epoch 180/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1233
Epoch 181/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1113
Epoch 182/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1040
Epoch 183/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1155
Epoch 184/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1049
Epoch 185/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1111
Epoch 186/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.1079
Epoch 187/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1021
Epoch 188/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1048
Epoch 189/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0971
Epoch 190/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0985
Epoch 191/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1026
Epoch 192/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1111
Epoch 193/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0991
Epoch 194/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0890
Epoch 195/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0880
Epoch 196/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1006
Epoch 197/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0974
Epoch 198/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1141
Epoch 199/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1423
Epoch 200/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1381
Epoch 201/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1105
Epoch 202/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1005
Epoch 203/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0846
Epoch 204/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1125
Epoch 205/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1129
Epoch 206/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1219
Epoch 207/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1161
Epoch 208/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1137
Epoch 209/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1178
Epoch 210/1000
```

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13/13 [==============================] - 0s 1ms/step - loss: 0.1017
Epoch 211/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1051
Epoch 212/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1014
Epoch 213/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1096
Epoch 214/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1087
Epoch 215/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1047
Epoch 216/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1044
Epoch 217/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1044
Epoch 218/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1006
Epoch 219/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1093
Epoch 220/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1041
Epoch 221/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0956
Epoch 222/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1109
Epoch 223/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1041
Epoch 224/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1000
Epoch 225/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0968
Epoch 226/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0951
Epoch 227/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1092
Epoch 228/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1041
Epoch 229/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1032
Epoch 230/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1153
Epoch 231/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1237
Epoch 232/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0978
Epoch 233/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1074
Epoch 234/1000
```

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13/13 [==============================] - 0s 1ms/step - loss: 0.1059
Epoch 235/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1122
Epoch 236/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0974
Epoch 237/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0879
Epoch 238/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0913
Epoch 239/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0831
Epoch 240/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0752
Epoch 241/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0733
Epoch 242/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0886
Epoch 243/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0837
Epoch 244/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0866
Epoch 245/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0933
Epoch 246/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0976
Epoch 247/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1150
Epoch 248/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0904
Epoch 249/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1073
Epoch 250/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1296
Epoch 251/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1022
Epoch 252/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0987
Epoch 253/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0846
Epoch 254/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0813
Epoch 255/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0924
Epoch 256/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0799
Epoch 257/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0947
Epoch 258/1000
```

```
13/13 [==============================] - 0s 4ms/step - loss: 0.0956
Epoch 259/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0788
Epoch 260/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1018
Epoch 261/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0942
Epoch 262/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0780
Epoch 263/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0821
Epoch 264/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0795
Epoch 265/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0924
Epoch 266/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0948
Epoch 267/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0767
Epoch 268/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0720
Epoch 269/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0742
Epoch 270/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0747
Epoch 271/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0726
Epoch 272/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0984
Epoch 273/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1074
Epoch 274/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0836
Epoch 275/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0783
Epoch 276/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0799
Epoch 277/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1225
Epoch 278/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1017
Epoch 279/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0990
Epoch 280/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1014
Epoch 281/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0808
Epoch 282/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.0798
Epoch 283/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0847
Epoch 284/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0755
Epoch 285/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0631
Epoch 286/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0651
Epoch 287/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0602
Epoch 288/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0733
Epoch 289/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0659
Epoch 290/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0682
Epoch 291/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0745
Epoch 292/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0848
Epoch 293/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0701
Epoch 294/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0828
Epoch 295/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0741
Epoch 296/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0890
Epoch 297/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0800
Epoch 298/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0803
Epoch 299/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0765
Epoch 300/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0733
Epoch 301/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0544
Epoch 302/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0718
Epoch 303/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0877
Epoch 304/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0687
Epoch 305/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0671
Epoch 306/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.0575
Epoch 307/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0773
Epoch 308/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0779
Epoch 309/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0696
Epoch 310/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0883
Epoch 311/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0880
Epoch 312/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0707
Epoch 313/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0603
Epoch 314/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0772
Epoch 315/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0660
Epoch 316/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0586
Epoch 317/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0618
Epoch 318/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0588
Epoch 319/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0674
Epoch 320/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0598
Epoch 321/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0670
Epoch 322/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0970
Epoch 323/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1366
Epoch 324/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1148
Epoch 325/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0837
Epoch 326/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0749
Epoch 327/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0746
Epoch 328/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0698
Epoch 329/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0691
Epoch 330/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0541
Epoch 331/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0558
Epoch 332/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0653
Epoch 333/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0593
Epoch 334/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0606
Epoch 335/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0696
Epoch 336/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0713
Epoch 337/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0628
Epoch 338/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0752
Epoch 339/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0723
Epoch 340/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0647
Epoch 341/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0688
Epoch 342/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0793
Epoch 343/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0595
Epoch 344/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0528
Epoch 345/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0552
Epoch 346/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0534
Epoch 347/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0471
Epoch 348/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0491
Epoch 349/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0524
Epoch 350/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0696
Epoch 351/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0690
Epoch 352/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0864
Epoch 353/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0999
Epoch 354/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.1094
Epoch 355/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1189
Epoch 356/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1059
Epoch 357/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0655
Epoch 358/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0652
Epoch 359/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0544
Epoch 360/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0545
Epoch 361/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0549
Epoch 362/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0581
Epoch 363/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0506
Epoch 364/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0579
Epoch 365/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0583
Epoch 366/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0607
Epoch 367/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0428
Epoch 368/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0495
Epoch 369/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0721
Epoch 370/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0817
Epoch 371/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0588
Epoch 372/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0516
Epoch 373/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0526
Epoch 374/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0463
Epoch 375/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0447
Epoch 376/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0441
Epoch 377/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0422
Epoch 378/1000
```

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13/13 [==============================] - 0s 1ms/step - loss: 0.0391
Epoch 379/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0343
Epoch 380/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0461
Epoch 381/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0442
Epoch 382/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0496
Epoch 383/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0509
Epoch 384/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0479
Epoch 385/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0520
Epoch 386/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0391
Epoch 387/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0394
Epoch 388/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0510
Epoch 389/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0525
Epoch 390/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0666
Epoch 391/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0490
Epoch 392/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0551
Epoch 393/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0689
Epoch 394/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0663
Epoch 395/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0844
Epoch 396/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0704
Epoch 397/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0700
Epoch 398/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0591
Epoch 399/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0586
Epoch 400/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0628
Epoch 401/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1717
Epoch 402/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.1648
Epoch 403/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1616
Epoch 404/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1326
Epoch 405/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1367
Epoch 406/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1098
Epoch 407/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1122
Epoch 408/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1798
Epoch 409/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1268
Epoch 410/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1123
Epoch 411/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0720
Epoch 412/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0774
Epoch 413/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0661
Epoch 414/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0720
Epoch 415/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0580
Epoch 416/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0572
Epoch 417/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0586
Epoch 418/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0546
Epoch 419/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0573
Epoch 420/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0721
Epoch 421/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0658
Epoch 422/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0686
Epoch 423/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0491
Epoch 424/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0647
Epoch 425/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0465
Epoch 426/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0435
Epoch 427/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0362
Epoch 428/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0411
Epoch 429/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0374
Epoch 430/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0412
Epoch 431/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0391
Epoch 432/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0412
Epoch 433/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0479
Epoch 434/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0436
Epoch 435/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0482
Epoch 436/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0420
Epoch 437/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0347
Epoch 438/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0390
Epoch 439/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0328
Epoch 440/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0371
Epoch 441/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0334
Epoch 442/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0348
Epoch 443/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0370
Epoch 444/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0408
Epoch 445/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0329
Epoch 446/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0318
Epoch 447/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0391
Epoch 448/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0408
Epoch 449/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0346
Epoch 450/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0340
Epoch 451/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0332
Epoch 452/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0325
Epoch 453/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0406
Epoch 454/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0394
Epoch 455/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0584
Epoch 456/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0440
Epoch 457/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0412
Epoch 458/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0468
Epoch 459/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0373
Epoch 460/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0329
Epoch 461/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0390
Epoch 462/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0284
Epoch 463/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0310
Epoch 464/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0348
Epoch 465/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0302
Epoch 466/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0348
Epoch 467/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0350
Epoch 468/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0347
Epoch 469/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0305
Epoch 470/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0369
Epoch 471/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0436
Epoch 472/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0543
Epoch 473/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0477
Epoch 474/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0630
Epoch 475/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1523
Epoch 476/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3248
Epoch 477/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1600
Epoch 478/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1623
Epoch 479/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1206
Epoch 480/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0955
Epoch 481/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1595
Epoch 482/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1626
Epoch 483/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1170
Epoch 484/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1481
Epoch 485/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0686
Epoch 486/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0590
Epoch 487/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0651
Epoch 488/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0575
Epoch 489/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0593
Epoch 490/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0539
Epoch 491/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0451
Epoch 492/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0436
Epoch 493/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0484
Epoch 494/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0639
Epoch 495/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0497
Epoch 496/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0787
Epoch 497/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0805
Epoch 498/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0639
Epoch 499/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0504
Epoch 500/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0478
Epoch 501/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0466
Epoch 502/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0419
Epoch 503/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0365
Epoch 504/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0352
Epoch 505/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0368
Epoch 506/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0337
Epoch 507/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0375
Epoch 508/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0317
Epoch 509/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0318
Epoch 510/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0364
Epoch 511/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0337
Epoch 512/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0290
Epoch 513/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0317
Epoch 514/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0320
Epoch 515/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0271
Epoch 516/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0343
Epoch 517/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0308
Epoch 518/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0388
Epoch 519/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0444
Epoch 520/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0381
Epoch 521/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0356
Epoch 522/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0324
Epoch 523/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0292
Epoch 524/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0308
Epoch 525/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0308
Epoch 526/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0365
Epoch 527/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0351
Epoch 528/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0305
Epoch 529/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0320
Epoch 530/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0351
Epoch 531/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0290
Epoch 532/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0329
Epoch 533/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0387
Epoch 534/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0431
Epoch 535/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0414
Epoch 536/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0318
Epoch 537/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0285
Epoch 538/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0278
Epoch 539/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0274
Epoch 540/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0338
Epoch 541/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0262
Epoch 542/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0283
Epoch 543/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0265
Epoch 544/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0267
Epoch 545/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0278
Epoch 546/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0256
Epoch 547/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0302
Epoch 548/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0323
Epoch 549/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0262
Epoch 550/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0288
Epoch 551/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0283
Epoch 552/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0315
Epoch 553/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0411
Epoch 554/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0376
Epoch 555/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0346
Epoch 556/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0296
Epoch 557/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0307
Epoch 558/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0270
Epoch 559/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0268
Epoch 560/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0303
Epoch 561/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0251
Epoch 562/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0267
Epoch 563/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0249
Epoch 564/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0265
Epoch 565/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0297
Epoch 566/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0338
Epoch 567/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0432
Epoch 568/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0483
Epoch 569/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1205
Epoch 570/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.1063
Epoch 571/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1035
Epoch 572/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1415
Epoch 573/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1534
Epoch 574/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1474
Epoch 575/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0772
Epoch 576/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0691
Epoch 577/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0770
Epoch 578/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0637
Epoch 579/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0528
Epoch 580/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0371
Epoch 581/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0356
Epoch 582/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0431
Epoch 583/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0300
Epoch 584/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0309
Epoch 585/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0307
Epoch 586/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0321
Epoch 587/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0266
Epoch 588/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0274
Epoch 589/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0276
Epoch 590/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0267
Epoch 591/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0305
Epoch 592/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0278
Epoch 593/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0343
Epoch 594/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.0259
Epoch 595/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0259
Epoch 596/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0258
Epoch 597/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0262
Epoch 598/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0254
Epoch 599/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0251
Epoch 600/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0241
Epoch 601/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0269
Epoch 602/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0287
Epoch 603/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0257
Epoch 604/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0254
Epoch 605/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0232
Epoch 606/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0281
Epoch 607/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0247
Epoch 608/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0254
Epoch 609/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0237
Epoch 610/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0253
Epoch 611/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0256
Epoch 612/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0235
Epoch 613/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0290
Epoch 614/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0236
Epoch 615/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0249
Epoch 616/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0253
Epoch 617/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0231
Epoch 618/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.0241
Epoch 619/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0253
Epoch 620/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0290
Epoch 621/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0456
Epoch 622/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0647
Epoch 623/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1078
Epoch 624/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1180
Epoch 625/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0837
Epoch 626/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0510
Epoch 627/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0333
Epoch 628/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0327
Epoch 629/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0389
Epoch 630/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0347
Epoch 631/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0342
Epoch 632/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0272
Epoch 633/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0240
Epoch 634/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0235
Epoch 635/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0243
Epoch 636/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0225
Epoch 637/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0222
Epoch 638/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0223
Epoch 639/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0215
Epoch 640/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0247
Epoch 641/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0248
Epoch 642/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.0257
Epoch 643/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0213
Epoch 644/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0277
Epoch 645/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0266
Epoch 646/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0320
Epoch 647/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0269
Epoch 648/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0357
Epoch 649/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0321
Epoch 650/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0255
Epoch 651/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0287
Epoch 652/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0251
Epoch 653/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0242
Epoch 654/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0239
Epoch 655/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0218
Epoch 656/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0227
Epoch 657/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0247
Epoch 658/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0265
Epoch 659/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0257
Epoch 660/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0233
Epoch 661/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0246
Epoch 662/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0313
Epoch 663/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0238
Epoch 664/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0277
Epoch 665/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0205
Epoch 666/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.0238
Epoch 667/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0249
Epoch 668/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0441
Epoch 669/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0441
Epoch 670/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0305
Epoch 671/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0323
Epoch 672/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0356
Epoch 673/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0670
Epoch 674/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1732
Epoch 675/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0889
Epoch 676/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1098
Epoch 677/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0468
Epoch 678/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0532
Epoch 679/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0577
Epoch 680/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0880
Epoch 681/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1123
Epoch 682/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1581
Epoch 683/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1343
Epoch 684/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1065
Epoch 685/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1236
Epoch 686/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1184
Epoch 687/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1218
Epoch 688/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1673
Epoch 689/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1437
Epoch 690/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0897
Epoch 691/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0665
Epoch 692/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0579
Epoch 693/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0563
Epoch 694/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0425
Epoch 695/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0441
Epoch 696/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0411
Epoch 697/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0429
Epoch 698/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0347
Epoch 699/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0367
Epoch 700/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0311
Epoch 701/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0333
Epoch 702/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0308
Epoch 703/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0287
Epoch 704/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0297
Epoch 705/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0282
Epoch 706/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0263
Epoch 707/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0286
Epoch 708/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0275
Epoch 709/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0274
Epoch 710/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0252
Epoch 711/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0277
Epoch 712/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0261
Epoch 713/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0311
Epoch 714/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0265
Epoch 715/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0281
Epoch 716/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0275
Epoch 717/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0264
Epoch 718/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0240
Epoch 719/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0234
Epoch 720/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0284
Epoch 721/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0311
Epoch 722/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0244
Epoch 723/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0249
Epoch 724/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0269
Epoch 725/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0224
Epoch 726/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0238
Epoch 727/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0234
Epoch 728/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0223
Epoch 729/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0220
Epoch 730/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0268
Epoch 731/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0363
Epoch 732/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0300
Epoch 733/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0208
Epoch 734/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0254
Epoch 735/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0264
Epoch 736/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0230
Epoch 737/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0224
Epoch 738/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0270
Epoch 739/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0257
Epoch 740/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0228
Epoch 741/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0249
Epoch 742/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0241
Epoch 743/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0210
Epoch 744/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0216
Epoch 745/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0208
Epoch 746/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0227
Epoch 747/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0193
Epoch 748/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0241
Epoch 749/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0217
Epoch 750/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0248
Epoch 751/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0203
Epoch 752/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0194
Epoch 753/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0252
Epoch 754/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0203
Epoch 755/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0206
Epoch 756/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0192
Epoch 757/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0213
Epoch 758/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0206
Epoch 759/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0247
Epoch 760/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0227
Epoch 761/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0204
Epoch 762/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0219
Epoch 763/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0266
Epoch 764/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0699
Epoch 765/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0436
Epoch 766/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0451
Epoch 767/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1029
Epoch 768/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1082
Epoch 769/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0924
Epoch 770/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0936
Epoch 771/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0690
Epoch 772/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0589
Epoch 773/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0519
Epoch 774/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0714
Epoch 775/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1015
Epoch 776/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0932
Epoch 777/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1891
Epoch 778/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1356
Epoch 779/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1081
Epoch 780/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0973
Epoch 781/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0768
Epoch 782/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0761
Epoch 783/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1075
Epoch 784/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0789
Epoch 785/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0467
Epoch 786/1000
```

```
13/13 [==============================] - 0s 4ms/step - loss: 0.0394
Epoch 787/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0360
Epoch 788/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0324
Epoch 789/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0329
Epoch 790/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0291
Epoch 791/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0283
Epoch 792/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0291
Epoch 793/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0261
Epoch 794/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0294
Epoch 795/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0250
Epoch 796/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0292
Epoch 797/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0286
Epoch 798/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0271
Epoch 799/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0307
Epoch 800/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0298
Epoch 801/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0371
Epoch 802/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0259
Epoch 803/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0274
Epoch 804/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0266
Epoch 805/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0260
Epoch 806/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0254
Epoch 807/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0258
Epoch 808/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0252
Epoch 809/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0280
Epoch 810/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0249
Epoch 811/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0255
Epoch 812/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0259
Epoch 813/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0310
Epoch 814/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0258
Epoch 815/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0246
Epoch 816/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0263
Epoch 817/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0328
Epoch 818/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0247
Epoch 819/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0250
Epoch 820/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0258
Epoch 821/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0252
Epoch 822/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0256
Epoch 823/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0299
Epoch 824/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0312
Epoch 825/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0243
Epoch 826/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0263
Epoch 827/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0247
Epoch 828/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0233
Epoch 829/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0246
Epoch 830/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0262
Epoch 831/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0259
Epoch 832/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0238
Epoch 833/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0221
Epoch 834/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0240
Epoch 835/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0248
Epoch 836/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0253
Epoch 837/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0340
Epoch 838/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0229
Epoch 839/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0294
Epoch 840/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0286
Epoch 841/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0268
Epoch 842/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0283
Epoch 843/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0271
Epoch 844/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0247
Epoch 845/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0235
Epoch 846/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0300
Epoch 847/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0246
Epoch 848/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0244
Epoch 849/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0219
Epoch 850/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0258
Epoch 851/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0244
Epoch 852/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0257
Epoch 853/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0220
Epoch 854/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0221
Epoch 855/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0256
Epoch 856/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0211
Epoch 857/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0227
Epoch 858/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0252
Epoch 859/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0224
Epoch 860/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0214
Epoch 861/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0204
Epoch 862/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0228
Epoch 863/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0206
Epoch 864/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0198
Epoch 865/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0200
Epoch 866/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0273
Epoch 867/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0271
Epoch 868/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0217
Epoch 869/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0231
Epoch 870/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0325
Epoch 871/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0354
Epoch 872/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0321
Epoch 873/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0216
Epoch 874/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0201
Epoch 875/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0218
Epoch 876/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0217
Epoch 877/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0275
Epoch 878/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0305
Epoch 879/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0440
Epoch 880/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0466
Epoch 881/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0729
Epoch 882/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0460
Epoch 883/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0439
Epoch 884/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0811
Epoch 885/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0291
Epoch 886/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0309
Epoch 887/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0289
Epoch 888/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0294
Epoch 889/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0283
Epoch 890/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0240
Epoch 891/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0232
Epoch 892/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0225
Epoch 893/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0196
Epoch 894/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0218
Epoch 895/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0189
Epoch 896/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0221
Epoch 897/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0204
Epoch 898/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0200
Epoch 899/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0208
Epoch 900/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0205
Epoch 901/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0199
Epoch 902/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0298
Epoch 903/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0185
Epoch 904/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0290
Epoch 905/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0272
Epoch 906/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.0237
Epoch 907/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0190
Epoch 908/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0210
Epoch 909/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0189
Epoch 910/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0199
Epoch 911/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0688
Epoch 912/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1337
Epoch 913/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1883
Epoch 914/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2096
Epoch 915/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1323
Epoch 916/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0795
Epoch 917/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1167
Epoch 918/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0621
Epoch 919/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0929
Epoch 920/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0352
Epoch 921/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0303
Epoch 922/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0287
Epoch 923/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0457
Epoch 924/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0712
Epoch 925/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0553
Epoch 926/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0385
Epoch 927/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0311
Epoch 928/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0394
Epoch 929/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0261
Epoch 930/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.0346
Epoch 931/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0332
Epoch 932/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0322
Epoch 933/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0311
Epoch 934/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0493
Epoch 935/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0289
Epoch 936/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0325
Epoch 937/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0255
Epoch 938/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0210
Epoch 939/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0235
Epoch 940/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0259
Epoch 941/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0371
Epoch 942/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0300
Epoch 943/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0265
Epoch 944/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0327
Epoch 945/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0367
Epoch 946/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0307
Epoch 947/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0376
Epoch 948/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0375
Epoch 949/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0350
Epoch 950/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0284
Epoch 951/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0293
Epoch 952/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0374
Epoch 953/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0353
Epoch 954/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.0395
Epoch 955/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0405
Epoch 956/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0432
Epoch 957/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0234
Epoch 958/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0266
Epoch 959/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0213
Epoch 960/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0200
Epoch 961/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0203
Epoch 962/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0190
Epoch 963/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0239
Epoch 964/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0240
Epoch 965/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0261
Epoch 966/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0197
Epoch 967/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0206
Epoch 968/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0188
Epoch 969/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0200
Epoch 970/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0169
Epoch 971/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0161
Epoch 972/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0176
Epoch 973/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0218
Epoch 974/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0161
Epoch 975/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0203
Epoch 976/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0384
Epoch 977/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0292
Epoch 978/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.0234
Epoch 979/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0522
Epoch 980/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0851
Epoch 981/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0541
Epoch 982/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0380
Epoch 983/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0328
Epoch 984/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0276
Epoch 985/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0227
Epoch 986/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0235
Epoch 987/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0287
Epoch 988/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0170
Epoch 989/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0166
Epoch 990/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0175
Epoch 991/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0149
Epoch 992/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0152
Epoch 993/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0153
Epoch 994/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0142
Epoch 995/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0199
Epoch 996/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0231
Epoch 997/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0199
Epoch 998/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0188
Epoch 999/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0155
Epoch 1000/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0172
```

[23]: <keras.callbacks.History at 0x7f7743bbd2d0>

```
[24]: # BEGIN UNIT TEST
      model.summary()

      model_test(model, classes, X_train.shape[1])
      # END UNIT TEST
```

Model: "Complex"

 Layer (type)   Output Shape   Param #
==
 dense (Dense)   (None, 120)   360

 dense_1 (Dense)   (None, 40)   4840

 dense_2 (Dense)   (None, 6)   246

==
Total params: 5,446
Trainable params: 5,446
Non-trainable params: 0

All tests passed!

Click for hints

Summary should match this (layer instance names may increment)

Model: "Complex"

Layer (type)   Output Shape   Param #
==
L1 (Dense)   (None, 120)   360

L2 (Dense)   (None, 40)   4840

L3 (Dense)   (None, 6)   246
==
Total params: 5,446
Trainable params: 5,446
Non-trainable params: 0

Click for more hints

```
tf.random.set_seed(1234)
model = Sequential(
    [
        Dense(120, activation = 'relu', name = "L1"),
        Dense(40, activation = 'relu', name = "L2"),
        Dense(classes, activation = 'linear', name = "L3")
```

```
        ], name="Complex"
    )
    model.compile(
        loss=tf.keras.losses.SparseCategoricalCrossentropy(from_logits=True),
        optimizer=tf.keras.optimizers.Adam(0.01),
    )

    model.fit(
        X_train,y_train,
        epochs=1000
    )
```

```
[25]: #make a model for plotting routines to call
      model_predict = lambda Xl: np.argmax(tf.nn.softmax(model.predict(Xl)).
      →numpy(),axis=1)
      plt_nn(model_predict,X_train,y_train, classes, X_cv, y_cv, suptitle="Complex␣
      →Model")
```

```
Canvas(toolbar=Toolbar(toolitems=[('Home', 'Reset original view', 'home', 'home'), ('Back', 'Ba
```

This model has worked very hard to capture outliers of each category. As a result, it has miscategorized some of the cross-validation data. Let's calculate the classification error.

```
[26]: training_cerr_complex = eval_cat_err(y_train, model_predict(X_train))
      cv_cerr_complex = eval_cat_err(y_cv, model_predict(X_cv))
      print(f"categorization error, training, complex model: {training_cerr_complex:0.
      →3f}")
      print(f"categorization error, cv,       complex model: {cv_cerr_complex:0.3f}")
```

```
categorization error, training, complex model: 0.003
categorization error, cv,       complex model: 0.122
```

5.1 Simple model Now, let's try a simple model

Exercise 4

Below, compose a two-layer model: * Dense layer with 6 units, relu activation * Dense layer with 6 units and a linear activation. Compile using * loss with `SparseCategoricalCrossentropy`, remember to use `from_logits=True` * Adam optimizer with learning rate of 0.01.

```
[27]: # UNQ_C4
      # GRADED CELL: model_s

      tf.random.set_seed(1234)
      model_s = Sequential(
          [
              ### START CODE HERE ###
              Dense(6, activation='relu'),
              Dense(6, activation='linear')
```

```
        ### END CODE HERE ###
    ], name = "Simple"
)
model_s.compile(
    ### START CODE HERE ###
    loss=tf.keras.losses.SparseCategoricalCrossentropy(from_logits=True),
    optimizer=tf.keras.optimizers.Adam(learning_rate=0.01),
    ### START CODE HERE ###
)
```

[28]:
```
import logging
logging.getLogger("tensorflow").setLevel(logging.ERROR)

# BEGIN UNIT TEST
model_s.fit(
    X_train,y_train,
    epochs=1000
)
# END UNIT TEST
```

```
Epoch 1/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.7306
Epoch 2/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.4468
Epoch 3/1000
13/13 [==============================] - 0s 860us/step - loss: 1.2902
Epoch 4/1000
13/13 [==============================] - 0s 846us/step - loss: 1.1367
Epoch 5/1000
13/13 [==============================] - 0s 891us/step - loss: 0.9710
Epoch 6/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7947
Epoch 7/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6499
Epoch 8/1000
13/13 [==============================] - 0s 990us/step - loss: 0.5378
Epoch 9/1000
13/13 [==============================] - 0s 927us/step - loss: 0.4652
Epoch 10/1000
13/13 [==============================] - 0s 826us/step - loss: 0.4184
Epoch 11/1000
13/13 [==============================] - 0s 817us/step - loss: 0.3860
Epoch 12/1000
13/13 [==============================] - 0s 805us/step - loss: 0.3641
Epoch 13/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3487
```

```
Epoch 14/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3316
Epoch 15/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3201
Epoch 16/1000
13/13 [==============================] - 0s 814us/step - loss: 0.3110
Epoch 17/1000
13/13 [==============================] - 0s 805us/step - loss: 0.3026
Epoch 18/1000
13/13 [==============================] - 0s 813us/step - loss: 0.2953
Epoch 19/1000
13/13 [==============================] - 0s 796us/step - loss: 0.2880
Epoch 20/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2824
Epoch 21/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2768
Epoch 22/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2716
Epoch 23/1000
13/13 [==============================] - 0s 967us/step - loss: 0.2690
Epoch 24/1000
13/13 [==============================] - 0s 942us/step - loss: 0.2618
Epoch 25/1000
13/13 [==============================] - 0s 941us/step - loss: 0.2606
Epoch 26/1000
13/13 [==============================] - 0s 998us/step - loss: 0.2560
Epoch 27/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2516
Epoch 28/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2500
Epoch 29/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2497
Epoch 30/1000
13/13 [==============================] - 0s 926us/step - loss: 0.2424
Epoch 31/1000
13/13 [==============================] - 0s 919us/step - loss: 0.2406
Epoch 32/1000
13/13 [==============================] - 0s 893us/step - loss: 0.2386
Epoch 33/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2371
Epoch 34/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2355
Epoch 35/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2328
Epoch 36/1000
13/13 [==============================] - 0s 892us/step - loss: 0.2311
Epoch 37/1000
13/13 [==============================] - 0s 859us/step - loss: 0.2289
```

```
Epoch 38/1000
13/13 [==============================] - 0s 823us/step - loss: 0.2271
Epoch 39/1000
13/13 [==============================] - 0s 853us/step - loss: 0.2278
Epoch 40/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2269
Epoch 41/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2244
Epoch 42/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2250
Epoch 43/1000
13/13 [==============================] - 0s 871us/step - loss: 0.2228
Epoch 44/1000
13/13 [==============================] - 0s 859us/step - loss: 0.2227
Epoch 45/1000
13/13 [==============================] - 0s 831us/step - loss: 0.2230
Epoch 46/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2198
Epoch 47/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2188
Epoch 48/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2156
Epoch 49/1000
13/13 [==============================] - 0s 889us/step - loss: 0.2156
Epoch 50/1000
13/13 [==============================] - 0s 814us/step - loss: 0.2165
Epoch 51/1000
13/13 [==============================] - 0s 822us/step - loss: 0.2155
Epoch 52/1000
13/13 [==============================] - 0s 805us/step - loss: 0.2130
Epoch 53/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2121
Epoch 54/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2122
Epoch 55/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2105
Epoch 56/1000
13/13 [==============================] - 0s 830us/step - loss: 0.2116
Epoch 57/1000
13/13 [==============================] - 0s 810us/step - loss: 0.2121
Epoch 58/1000
13/13 [==============================] - 0s 803us/step - loss: 0.2084
Epoch 59/1000
13/13 [==============================] - 0s 798us/step - loss: 0.2122
Epoch 60/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2101
Epoch 61/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2095
```

```
Epoch 62/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2092
Epoch 63/1000
13/13 [==============================] - 0s 881us/step - loss: 0.2116
Epoch 64/1000
13/13 [==============================] - 0s 807us/step - loss: 0.2085
Epoch 65/1000
13/13 [==============================] - 0s 800us/step - loss: 0.2120
Epoch 66/1000
13/13 [==============================] - 0s 793us/step - loss: 0.2087
Epoch 67/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2107
Epoch 68/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2090
Epoch 69/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2084
Epoch 70/1000
13/13 [==============================] - 0s 871us/step - loss: 0.2053
Epoch 71/1000
13/13 [==============================] - 0s 823us/step - loss: 0.2060
Epoch 72/1000
13/13 [==============================] - 0s 835us/step - loss: 0.2061
Epoch 73/1000
13/13 [==============================] - 0s 825us/step - loss: 0.2075
Epoch 74/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2067
Epoch 75/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2039
Epoch 76/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2036
Epoch 77/1000
13/13 [==============================] - 0s 849us/step - loss: 0.2062
Epoch 78/1000
13/13 [==============================] - 0s 814us/step - loss: 0.2017
Epoch 79/1000
13/13 [==============================] - 0s 809us/step - loss: 0.2044
Epoch 80/1000
13/13 [==============================] - 0s 828us/step - loss: 0.2055
Epoch 81/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1999
Epoch 82/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2028
Epoch 83/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2019
Epoch 84/1000
13/13 [==============================] - 0s 865us/step - loss: 0.2042
Epoch 85/1000
13/13 [==============================] - 0s 874us/step - loss: 0.2016
```

```
Epoch 86/1000
13/13 [==============================] - 0s 978us/step - loss: 0.2068
Epoch 87/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2005
Epoch 88/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2011
Epoch 89/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2000
Epoch 90/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1998
Epoch 91/1000
13/13 [==============================] - 0s 875us/step - loss: 0.1992
Epoch 92/1000
13/13 [==============================] - 0s 859us/step - loss: 0.2001
Epoch 93/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1997
Epoch 94/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2008
Epoch 95/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2015
Epoch 96/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2011
Epoch 97/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2006
Epoch 98/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2031
Epoch 99/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1991
Epoch 100/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2006
Epoch 101/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2010
Epoch 102/1000
13/13 [==============================] - 0s 829us/step - loss: 0.2018
Epoch 103/1000
13/13 [==============================] - 0s 821us/step - loss: 0.2026
Epoch 104/1000
13/13 [==============================] - 0s 821us/step - loss: 0.1988
Epoch 105/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1974
Epoch 106/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1966
Epoch 107/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1963
Epoch 108/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1969
Epoch 109/1000
13/13 [==============================] - 0s 890us/step - loss: 0.1987
```

```
Epoch 110/1000
13/13 [==============================] - 0s 872us/step - loss: 0.1978
Epoch 111/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1962
Epoch 112/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1979
Epoch 113/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1944
Epoch 114/1000
13/13 [==============================] - 0s 922us/step - loss: 0.1987
Epoch 115/1000
13/13 [==============================] - 0s 964us/step - loss: 0.1934
Epoch 116/1000
13/13 [==============================] - 0s 955us/step - loss: 0.2009
Epoch 117/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1943
Epoch 118/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1969
Epoch 119/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1951
Epoch 120/1000
13/13 [==============================] - 0s 851us/step - loss: 0.1964
Epoch 121/1000
13/13 [==============================] - 0s 888us/step - loss: 0.1957
Epoch 122/1000
13/13 [==============================] - 0s 831us/step - loss: 0.1970
Epoch 123/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1960
Epoch 124/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1973
Epoch 125/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1961
Epoch 126/1000
13/13 [==============================] - 0s 987us/step - loss: 0.1957
Epoch 127/1000
13/13 [==============================] - 0s 839us/step - loss: 0.1949
Epoch 128/1000
13/13 [==============================] - 0s 825us/step - loss: 0.1946
Epoch 129/1000
13/13 [==============================] - 0s 857us/step - loss: 0.1944
Epoch 130/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1969
Epoch 131/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1926
Epoch 132/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1925
Epoch 133/1000
13/13 [==============================] - 0s 873us/step - loss: 0.1933
```

```
Epoch 134/1000
13/13 [==============================] - 0s 887us/step - loss: 0.1942
Epoch 135/1000
13/13 [==============================] - 0s 861us/step - loss: 0.1976
Epoch 136/1000
13/13 [==============================] - 0s 878us/step - loss: 0.1939
Epoch 137/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1931
Epoch 138/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1947
Epoch 139/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1941
Epoch 140/1000
13/13 [==============================] - 0s 896us/step - loss: 0.1917
Epoch 141/1000
13/13 [==============================] - 0s 913us/step - loss: 0.1922
Epoch 142/1000
13/13 [==============================] - 0s 931us/step - loss: 0.1917
Epoch 143/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1944
Epoch 144/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1948
Epoch 145/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1921
Epoch 146/1000
13/13 [==============================] - 0s 862us/step - loss: 0.1920
Epoch 147/1000
13/13 [==============================] - 0s 818us/step - loss: 0.1925
Epoch 148/1000
13/13 [==============================] - 0s 818us/step - loss: 0.1899
Epoch 149/1000
13/13 [==============================] - 0s 826us/step - loss: 0.1913
Epoch 150/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1914
Epoch 151/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1944
Epoch 152/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1920
Epoch 153/1000
13/13 [==============================] - 0s 940us/step - loss: 0.1949
Epoch 154/1000
13/13 [==============================] - 0s 962us/step - loss: 0.1904
Epoch 155/1000
13/13 [==============================] - 0s 932us/step - loss: 0.1917
Epoch 156/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1898
Epoch 157/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1913
```

```
Epoch 158/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1905
Epoch 159/1000
13/13 [==============================] - 0s 927us/step - loss: 0.1898
Epoch 160/1000
13/13 [==============================] - 0s 916us/step - loss: 0.1910
Epoch 161/1000
13/13 [==============================] - 0s 908us/step - loss: 0.1913
Epoch 162/1000
13/13 [==============================] - 0s 850us/step - loss: 0.1930
Epoch 163/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1913
Epoch 164/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1907
Epoch 165/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1910
Epoch 166/1000
13/13 [==============================] - 0s 861us/step - loss: 0.1891
Epoch 167/1000
13/13 [==============================] - 0s 843us/step - loss: 0.1940
Epoch 168/1000
13/13 [==============================] - 0s 853us/step - loss: 0.1914
Epoch 169/1000
13/13 [==============================] - 0s 953us/step - loss: 0.1914
Epoch 170/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1893
Epoch 171/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1894
Epoch 172/1000
13/13 [==============================] - 0s 988us/step - loss: 0.1879
Epoch 173/1000
13/13 [==============================] - 0s 928us/step - loss: 0.1924
Epoch 174/1000
13/13 [==============================] - 0s 906us/step - loss: 0.1887
Epoch 175/1000
13/13 [==============================] - 0s 890us/step - loss: 0.1876
Epoch 176/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1861
Epoch 177/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1922
Epoch 178/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1977
Epoch 179/1000
13/13 [==============================] - 0s 925us/step - loss: 0.1881
Epoch 180/1000
13/13 [==============================] - 0s 901us/step - loss: 0.1894
Epoch 181/1000
13/13 [==============================] - 0s 833us/step - loss: 0.1906
```

```
Epoch 182/1000
13/13 [==============================] - 0s 873us/step - loss: 0.1894
Epoch 183/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1872
Epoch 184/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1893
Epoch 185/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1885
Epoch 186/1000
13/13 [==============================] - 0s 885us/step - loss: 0.1867
Epoch 187/1000
13/13 [==============================] - 0s 900us/step - loss: 0.1866
Epoch 188/1000
13/13 [==============================] - 0s 912us/step - loss: 0.1884
Epoch 189/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1907
Epoch 190/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1890
Epoch 191/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1880
Epoch 192/1000
13/13 [==============================] - 0s 949us/step - loss: 0.1863
Epoch 193/1000
13/13 [==============================] - 0s 921us/step - loss: 0.1904
Epoch 194/1000
13/13 [==============================] - 0s 908us/step - loss: 0.1857
Epoch 195/1000
13/13 [==============================] - 0s 918us/step - loss: 0.1859
Epoch 196/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1856
Epoch 197/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1879
Epoch 198/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1884
Epoch 199/1000
13/13 [==============================] - 0s 912us/step - loss: 0.1894
Epoch 200/1000
13/13 [==============================] - 0s 902us/step - loss: 0.1860
Epoch 201/1000
13/13 [==============================] - 0s 909us/step - loss: 0.1869
Epoch 202/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1837
Epoch 203/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1861
Epoch 204/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1869
Epoch 205/1000
13/13 [==============================] - 0s 917us/step - loss: 0.1846
```

```
Epoch 206/1000
13/13 [==============================] - 0s 902us/step - loss: 0.1881
Epoch 207/1000
13/13 [==============================] - 0s 891us/step - loss: 0.1841
Epoch 208/1000
13/13 [==============================] - 0s 884us/step - loss: 0.1902
Epoch 209/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1850
Epoch 210/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1883
Epoch 211/1000
13/13 [==============================] - 0s 990us/step - loss: 0.1863
Epoch 212/1000
13/13 [==============================] - 0s 829us/step - loss: 0.1856
Epoch 213/1000
13/13 [==============================] - 0s 915us/step - loss: 0.1860
Epoch 214/1000
13/13 [==============================] - 0s 907us/step - loss: 0.1890
Epoch 215/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1855
Epoch 216/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1891
Epoch 217/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1834
Epoch 218/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1887
Epoch 219/1000
13/13 [==============================] - 0s 878us/step - loss: 0.1857
Epoch 220/1000
13/13 [==============================] - 0s 878us/step - loss: 0.1844
Epoch 221/1000
13/13 [==============================] - 0s 828us/step - loss: 0.1846
Epoch 222/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1843
Epoch 223/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1878
Epoch 224/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1884
Epoch 225/1000
13/13 [==============================] - 0s 968us/step - loss: 0.1851
Epoch 226/1000
13/13 [==============================] - 0s 993us/step - loss: 0.1844
Epoch 227/1000
13/13 [==============================] - 0s 965us/step - loss: 0.1824
Epoch 228/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1849
Epoch 229/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1879
```

```
Epoch 230/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1860
Epoch 231/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1834
Epoch 232/1000
13/13 [==============================] - 0s 852us/step - loss: 0.1882
Epoch 233/1000
13/13 [==============================] - 0s 887us/step - loss: 0.1851
Epoch 234/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1874
Epoch 235/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1822
Epoch 236/1000
13/13 [==============================] - 0s 993us/step - loss: 0.1841
Epoch 237/1000
13/13 [==============================] - 0s 827us/step - loss: 0.1876
Epoch 238/1000
13/13 [==============================] - 0s 836us/step - loss: 0.1923
Epoch 239/1000
13/13 [==============================] - 0s 843us/step - loss: 0.1867
Epoch 240/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1832
Epoch 241/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1863
Epoch 242/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1978
Epoch 243/1000
13/13 [==============================] - 0s 999us/step - loss: 0.1946
Epoch 244/1000
13/13 [==============================] - 0s 952us/step - loss: 0.1871
Epoch 245/1000
13/13 [==============================] - 0s 946us/step - loss: 0.1826
Epoch 246/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1850
Epoch 247/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1836
Epoch 248/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1820
Epoch 249/1000
13/13 [==============================] - 0s 878us/step - loss: 0.1857
Epoch 250/1000
13/13 [==============================] - 0s 920us/step - loss: 0.1829
Epoch 251/1000
13/13 [==============================] - 0s 918us/step - loss: 0.1838
Epoch 252/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1828
Epoch 253/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1842
```

```
Epoch 254/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1832
Epoch 255/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1830
Epoch 256/1000
13/13 [==============================] - 0s 822us/step - loss: 0.1830
Epoch 257/1000
13/13 [==============================] - 0s 814us/step - loss: 0.1833
Epoch 258/1000
13/13 [==============================] - 0s 812us/step - loss: 0.1826
Epoch 259/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1796
Epoch 260/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1876
Epoch 261/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1819
Epoch 262/1000
13/13 [==============================] - 0s 911us/step - loss: 0.1826
Epoch 263/1000
13/13 [==============================] - 0s 858us/step - loss: 0.1827
Epoch 264/1000
13/13 [==============================] - 0s 855us/step - loss: 0.1820
Epoch 265/1000
13/13 [==============================] - 0s 851us/step - loss: 0.1831
Epoch 266/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1805
Epoch 267/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1835
Epoch 268/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1812
Epoch 269/1000
13/13 [==============================] - 0s 859us/step - loss: 0.1817
Epoch 270/1000
13/13 [==============================] - 0s 856us/step - loss: 0.1836
Epoch 271/1000
13/13 [==============================] - 0s 868us/step - loss: 0.1801
Epoch 272/1000
13/13 [==============================] - 0s 941us/step - loss: 0.1868
Epoch 273/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1869
Epoch 274/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1815
Epoch 275/1000
13/13 [==============================] - 0s 958us/step - loss: 0.1847
Epoch 276/1000
13/13 [==============================] - 0s 839us/step - loss: 0.1787
Epoch 277/1000
13/13 [==============================] - 0s 832us/step - loss: 0.1841
```

```
Epoch 278/1000
13/13 [==============================] - 0s 824us/step - loss: 0.1804
Epoch 279/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1861
Epoch 280/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1816
Epoch 281/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1797
Epoch 282/1000
13/13 [==============================] - 0s 813us/step - loss: 0.1807
Epoch 283/1000
13/13 [==============================] - 0s 820us/step - loss: 0.1815
Epoch 284/1000
13/13 [==============================] - 0s 811us/step - loss: 0.1822
Epoch 285/1000
13/13 [==============================] - 0s 807us/step - loss: 0.1813
Epoch 286/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1815
Epoch 287/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1829
Epoch 288/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1849
Epoch 289/1000
13/13 [==============================] - 0s 927us/step - loss: 0.1805
Epoch 290/1000
13/13 [==============================] - 0s 890us/step - loss: 0.1807
Epoch 291/1000
13/13 [==============================] - 0s 873us/step - loss: 0.1801
Epoch 292/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1793
Epoch 293/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1815
Epoch 294/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1784
Epoch 295/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1867
Epoch 296/1000
13/13 [==============================] - 0s 936us/step - loss: 0.1805
Epoch 297/1000
13/13 [==============================] - 0s 905us/step - loss: 0.1855
Epoch 298/1000
13/13 [==============================] - 0s 873us/step - loss: 0.1816
Epoch 299/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1798
Epoch 300/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1817
Epoch 301/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1823
```

```
Epoch 302/1000
13/13 [==============================] - 0s 893us/step - loss: 0.1878
Epoch 303/1000
13/13 [==============================] - 0s 868us/step - loss: 0.1788
Epoch 304/1000
13/13 [==============================] - 0s 878us/step - loss: 0.1850
Epoch 305/1000
13/13 [==============================] - 0s 896us/step - loss: 0.1827
Epoch 306/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1818
Epoch 307/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1811
Epoch 308/1000
13/13 [==============================] - 0s 986us/step - loss: 0.1827
Epoch 309/1000
13/13 [==============================] - 0s 835us/step - loss: 0.1814
Epoch 310/1000
13/13 [==============================] - 0s 831us/step - loss: 0.1854
Epoch 311/1000
13/13 [==============================] - 0s 814us/step - loss: 0.1785
Epoch 312/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1831
Epoch 313/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1775
Epoch 314/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1820
Epoch 315/1000
13/13 [==============================] - 0s 959us/step - loss: 0.1801
Epoch 316/1000
13/13 [==============================] - 0s 825us/step - loss: 0.1792
Epoch 317/1000
13/13 [==============================] - 0s 804us/step - loss: 0.1847
Epoch 318/1000
13/13 [==============================] - 0s 818us/step - loss: 0.1841
Epoch 319/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1811
Epoch 320/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1841
Epoch 321/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1785
Epoch 322/1000
13/13 [==============================] - 0s 970us/step - loss: 0.1815
Epoch 323/1000
13/13 [==============================] - 0s 842us/step - loss: 0.1792
Epoch 324/1000
13/13 [==============================] - 0s 842us/step - loss: 0.1829
Epoch 325/1000
13/13 [==============================] - 0s 844us/step - loss: 0.1800
```

```
Epoch 326/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1783
Epoch 327/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1797
Epoch 328/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1846
Epoch 329/1000
13/13 [==============================] - 0s 919us/step - loss: 0.1790
Epoch 330/1000
13/13 [==============================] - 0s 853us/step - loss: 0.1815
Epoch 331/1000
13/13 [==============================] - 0s 832us/step - loss: 0.1801
Epoch 332/1000
13/13 [==============================] - 0s 998us/step - loss: 0.1803
Epoch 333/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1824
Epoch 334/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1849
Epoch 335/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1835
Epoch 336/1000
13/13 [==============================] - 0s 940us/step - loss: 0.1797
Epoch 337/1000
13/13 [==============================] - 0s 971us/step - loss: 0.1805
Epoch 338/1000
13/13 [==============================] - 0s 921us/step - loss: 0.1796
Epoch 339/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1807
Epoch 340/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1794
Epoch 341/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1808
Epoch 342/1000
13/13 [==============================] - 0s 887us/step - loss: 0.1790
Epoch 343/1000
13/13 [==============================] - 0s 878us/step - loss: 0.1797
Epoch 344/1000
13/13 [==============================] - 0s 909us/step - loss: 0.1804
Epoch 345/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1838
Epoch 346/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1832
Epoch 347/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1819
Epoch 348/1000
13/13 [==============================] - 0s 962us/step - loss: 0.1800
Epoch 349/1000
13/13 [==============================] - 0s 842us/step - loss: 0.1789
```

```
Epoch 350/1000
13/13 [==============================] - 0s 856us/step - loss: 0.1787
Epoch 351/1000
13/13 [==============================] - 0s 852us/step - loss: 0.1784
Epoch 352/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1846
Epoch 353/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1826
Epoch 354/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1802
Epoch 355/1000
13/13 [==============================] - 0s 954us/step - loss: 0.1792
Epoch 356/1000
13/13 [==============================] - 0s 940us/step - loss: 0.1786
Epoch 357/1000
13/13 [==============================] - 0s 928us/step - loss: 0.1802
Epoch 358/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1781
Epoch 359/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1800
Epoch 360/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1821
Epoch 361/1000
13/13 [==============================] - 0s 921us/step - loss: 0.1789
Epoch 362/1000
13/13 [==============================] - 0s 912us/step - loss: 0.1798
Epoch 363/1000
13/13 [==============================] - 0s 880us/step - loss: 0.1815
Epoch 364/1000
13/13 [==============================] - 0s 848us/step - loss: 0.1799
Epoch 365/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1811
Epoch 366/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1785
Epoch 367/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1776
Epoch 368/1000
13/13 [==============================] - 0s 853us/step - loss: 0.1784
Epoch 369/1000
13/13 [==============================] - 0s 828us/step - loss: 0.1819
Epoch 370/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1771
Epoch 371/1000
13/13 [==============================] - 0s 877us/step - loss: 0.1799
Epoch 372/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1780
Epoch 373/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1773
```

```
Epoch 374/1000
13/13 [==============================] - 0s 970us/step - loss: 0.1769
Epoch 375/1000
13/13 [==============================] - 0s 839us/step - loss: 0.1770
Epoch 376/1000
13/13 [==============================] - 0s 820us/step - loss: 0.1766
Epoch 377/1000
13/13 [==============================] - 0s 832us/step - loss: 0.1768
Epoch 378/1000
13/13 [==============================] - 0s 841us/step - loss: 0.1794
Epoch 379/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1799
Epoch 380/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1768
Epoch 381/1000
13/13 [==============================] - 0s 987us/step - loss: 0.1805
Epoch 382/1000
13/13 [==============================] - 0s 872us/step - loss: 0.1782
Epoch 383/1000
13/13 [==============================] - 0s 847us/step - loss: 0.1843
Epoch 384/1000
13/13 [==============================] - 0s 854us/step - loss: 0.1763
Epoch 385/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1790
Epoch 386/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1781
Epoch 387/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1771
Epoch 388/1000
13/13 [==============================] - 0s 933us/step - loss: 0.1809
Epoch 389/1000
13/13 [==============================] - 0s 908us/step - loss: 0.1807
Epoch 390/1000
13/13 [==============================] - 0s 891us/step - loss: 0.1792
Epoch 391/1000
13/13 [==============================] - 0s 899us/step - loss: 0.1767
Epoch 392/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1767
Epoch 393/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1763
Epoch 394/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1768
Epoch 395/1000
13/13 [==============================] - 0s 820us/step - loss: 0.1789
Epoch 396/1000
13/13 [==============================] - 0s 815us/step - loss: 0.1801
Epoch 397/1000
13/13 [==============================] - 0s 825us/step - loss: 0.1805
```

```
Epoch 398/1000
13/13 [==============================] - 0s 992us/step - loss: 0.1783
Epoch 399/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1775
Epoch 400/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1796
Epoch 401/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1776
Epoch 402/1000
13/13 [==============================] - 0s 856us/step - loss: 0.1771
Epoch 403/1000
13/13 [==============================] - 0s 803us/step - loss: 0.1765
Epoch 404/1000
13/13 [==============================] - 0s 779us/step - loss: 0.1775
Epoch 405/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1753
Epoch 406/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1759
Epoch 407/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1776
Epoch 408/1000
13/13 [==============================] - 0s 859us/step - loss: 0.1779
Epoch 409/1000
13/13 [==============================] - 0s 826us/step - loss: 0.1759
Epoch 410/1000
13/13 [==============================] - 0s 932us/step - loss: 0.1798
Epoch 411/1000
13/13 [==============================] - 0s 900us/step - loss: 0.1807
Epoch 412/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1778
Epoch 413/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1771
Epoch 414/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1760
Epoch 415/1000
13/13 [==============================] - 0s 921us/step - loss: 0.1760
Epoch 416/1000
13/13 [==============================] - 0s 907us/step - loss: 0.1782
Epoch 417/1000
13/13 [==============================] - 0s 896us/step - loss: 0.1756
Epoch 418/1000
13/13 [==============================] - 0s 1000us/step - loss: 0.1762
Epoch 419/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1756
Epoch 420/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1773
Epoch 421/1000
13/13 [==============================] - 0s 988us/step - loss: 0.1761
```

```
Epoch 422/1000
13/13 [==============================] - 0s 916us/step - loss: 0.1753
Epoch 423/1000
13/13 [==============================] - 0s 896us/step - loss: 0.1777
Epoch 424/1000
13/13 [==============================] - 0s 903us/step - loss: 0.1754
Epoch 425/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1779
Epoch 426/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1781
Epoch 427/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1739
Epoch 428/1000
13/13 [==============================] - 0s 912us/step - loss: 0.1757
Epoch 429/1000
13/13 [==============================] - 0s 889us/step - loss: 0.1755
Epoch 430/1000
13/13 [==============================] - 0s 890us/step - loss: 0.1775
Epoch 431/1000
13/13 [==============================] - 0s 933us/step - loss: 0.1775
Epoch 432/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1773
Epoch 433/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1777
Epoch 434/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1781
Epoch 435/1000
13/13 [==============================] - 0s 917us/step - loss: 0.1761
Epoch 436/1000
13/13 [==============================] - 0s 929us/step - loss: 0.1775
Epoch 437/1000
13/13 [==============================] - 0s 825us/step - loss: 0.1788
Epoch 438/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1762
Epoch 439/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1752
Epoch 440/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1742
Epoch 441/1000
13/13 [==============================] - 0s 911us/step - loss: 0.1765
Epoch 442/1000
13/13 [==============================] - 0s 823us/step - loss: 0.1776
Epoch 443/1000
13/13 [==============================] - 0s 801us/step - loss: 0.1755
Epoch 444/1000
13/13 [==============================] - 0s 807us/step - loss: 0.1773
Epoch 445/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1763
```

```
Epoch 446/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1764
Epoch 447/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1792
Epoch 448/1000
13/13 [==============================] - 0s 964us/step - loss: 0.1746
Epoch 449/1000
13/13 [==============================] - 0s 863us/step - loss: 0.1752
Epoch 450/1000
13/13 [==============================] - 0s 850us/step - loss: 0.1773
Epoch 451/1000
13/13 [==============================] - 0s 867us/step - loss: 0.1772
Epoch 452/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1764
Epoch 453/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1754
Epoch 454/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1748
Epoch 455/1000
13/13 [==============================] - 0s 858us/step - loss: 0.1752
Epoch 456/1000
13/13 [==============================] - 0s 833us/step - loss: 0.1753
Epoch 457/1000
13/13 [==============================] - 0s 813us/step - loss: 0.1785
Epoch 458/1000
13/13 [==============================] - 0s 818us/step - loss: 0.1744
Epoch 459/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1758
Epoch 460/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1759
Epoch 461/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1750
Epoch 462/1000
13/13 [==============================] - 0s 840us/step - loss: 0.1745
Epoch 463/1000
13/13 [==============================] - 0s 842us/step - loss: 0.1792
Epoch 464/1000
13/13 [==============================] - 0s 844us/step - loss: 0.1752
Epoch 465/1000
13/13 [==============================] - 0s 962us/step - loss: 0.1756
Epoch 466/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1752
Epoch 467/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1774
Epoch 468/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1748
Epoch 469/1000
13/13 [==============================] - 0s 953us/step - loss: 0.1767
```

```
Epoch 470/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1813
Epoch 471/1000
13/13 [==============================] - 0s 963us/step - loss: 0.1793
Epoch 472/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1748
Epoch 473/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1762
Epoch 474/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1822
Epoch 475/1000
13/13 [==============================] - 0s 894us/step - loss: 0.1788
Epoch 476/1000
13/13 [==============================] - 0s 931us/step - loss: 0.1760
Epoch 477/1000
13/13 [==============================] - 0s 899us/step - loss: 0.1758
Epoch 478/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1763
Epoch 479/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1751
Epoch 480/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1749
Epoch 481/1000
13/13 [==============================] - 0s 902us/step - loss: 0.1742
Epoch 482/1000
13/13 [==============================] - 0s 798us/step - loss: 0.1745
Epoch 483/1000
13/13 [==============================] - 0s 800us/step - loss: 0.1763
Epoch 484/1000
13/13 [==============================] - 0s 814us/step - loss: 0.1767
Epoch 485/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1780
Epoch 486/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1739
Epoch 487/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1781
Epoch 488/1000
13/13 [==============================] - 0s 919us/step - loss: 0.1755
Epoch 489/1000
13/13 [==============================] - 0s 826us/step - loss: 0.1766
Epoch 490/1000
13/13 [==============================] - 0s 803us/step - loss: 0.1783
Epoch 491/1000
13/13 [==============================] - 0s 803us/step - loss: 0.1769
Epoch 492/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1752
Epoch 493/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1772
```

```
Epoch 494/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1739
Epoch 495/1000
13/13 [==============================] - 0s 846us/step - loss: 0.1750
Epoch 496/1000
13/13 [==============================] - 0s 863us/step - loss: 0.1798
Epoch 497/1000
13/13 [==============================] - 0s 851us/step - loss: 0.1744
Epoch 498/1000
13/13 [==============================] - 0s 854us/step - loss: 0.1750
Epoch 499/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1750
Epoch 500/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1735
Epoch 501/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1783
Epoch 502/1000
13/13 [==============================] - 0s 928us/step - loss: 0.1749
Epoch 503/1000
13/13 [==============================] - 0s 826us/step - loss: 0.1749
Epoch 504/1000
13/13 [==============================] - 0s 822us/step - loss: 0.1741
Epoch 505/1000
13/13 [==============================] - 0s 819us/step - loss: 0.1767
Epoch 506/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1752
Epoch 507/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1764
Epoch 508/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1719
Epoch 509/1000
13/13 [==============================] - 0s 843us/step - loss: 0.1791
Epoch 510/1000
13/13 [==============================] - 0s 841us/step - loss: 0.1746
Epoch 511/1000
13/13 [==============================] - 0s 837us/step - loss: 0.1786
Epoch 512/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1737
Epoch 513/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1781
Epoch 514/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1766
Epoch 515/1000
13/13 [==============================] - 0s 928us/step - loss: 0.1730
Epoch 516/1000
13/13 [==============================] - 0s 905us/step - loss: 0.1738
Epoch 517/1000
13/13 [==============================] - 0s 884us/step - loss: 0.1729
```

```
Epoch 518/1000
13/13 [==============================] - 0s 896us/step - loss: 0.1747
Epoch 519/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1759
Epoch 520/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1748
Epoch 521/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1762
Epoch 522/1000
13/13 [==============================] - 0s 899us/step - loss: 0.1750
Epoch 523/1000
13/13 [==============================] - 0s 909us/step - loss: 0.1751
Epoch 524/1000
13/13 [==============================] - 0s 914us/step - loss: 0.1747
Epoch 525/1000
13/13 [==============================] - 0s 1000us/step - loss: 0.1739
Epoch 526/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1731
Epoch 527/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1783
Epoch 528/1000
13/13 [==============================] - 0s 886us/step - loss: 0.1810
Epoch 529/1000
13/13 [==============================] - 0s 820us/step - loss: 0.1770
Epoch 530/1000
13/13 [==============================] - 0s 794us/step - loss: 0.1740
Epoch 531/1000
13/13 [==============================] - 0s 800us/step - loss: 0.1743
Epoch 532/1000
13/13 [==============================] - 0s 886us/step - loss: 0.1759
Epoch 533/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1786
Epoch 534/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1766
Epoch 535/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1755
Epoch 536/1000
13/13 [==============================] - 0s 944us/step - loss: 0.1749
Epoch 537/1000
13/13 [==============================] - 0s 797us/step - loss: 0.1713
Epoch 538/1000
13/13 [==============================] - 0s 891us/step - loss: 0.1774
Epoch 539/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1741
Epoch 540/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1774
Epoch 541/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1734
```

```
Epoch 542/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1754
Epoch 543/1000
13/13 [==============================] - 0s 849us/step - loss: 0.1735
Epoch 544/1000
13/13 [==============================] - 0s 842us/step - loss: 0.1758
Epoch 545/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1723
Epoch 546/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1786
Epoch 547/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1743
Epoch 548/1000
13/13 [==============================] - 0s 847us/step - loss: 0.1750
Epoch 549/1000
13/13 [==============================] - 0s 856us/step - loss: 0.1747
Epoch 550/1000
13/13 [==============================] - 0s 851us/step - loss: 0.1768
Epoch 551/1000
13/13 [==============================] - 0s 861us/step - loss: 0.1732
Epoch 552/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1736
Epoch 553/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1725
Epoch 554/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1748
Epoch 555/1000
13/13 [==============================] - 0s 903us/step - loss: 0.1733
Epoch 556/1000
13/13 [==============================] - 0s 847us/step - loss: 0.1727
Epoch 557/1000
13/13 [==============================] - 0s 838us/step - loss: 0.1754
Epoch 558/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1781
Epoch 559/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1805
Epoch 560/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1764
Epoch 561/1000
13/13 [==============================] - 0s 817us/step - loss: 0.1784
Epoch 562/1000
13/13 [==============================] - 0s 815us/step - loss: 0.1715
Epoch 563/1000
13/13 [==============================] - 0s 809us/step - loss: 0.1730
Epoch 564/1000
13/13 [==============================] - 0s 810us/step - loss: 0.1733
Epoch 565/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1718
```

```
Epoch 566/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1750
Epoch 567/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1751
Epoch 568/1000
13/13 [==============================] - 0s 954us/step - loss: 0.1728
Epoch 569/1000
13/13 [==============================] - 0s 928us/step - loss: 0.1730
Epoch 570/1000
13/13 [==============================] - 0s 921us/step - loss: 0.1761
Epoch 571/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1798
Epoch 572/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1762
Epoch 573/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1727
Epoch 574/1000
13/13 [==============================] - 0s 938us/step - loss: 0.1722
Epoch 575/1000
13/13 [==============================] - 0s 858us/step - loss: 0.1717
Epoch 576/1000
13/13 [==============================] - 0s 853us/step - loss: 0.1730
Epoch 577/1000
13/13 [==============================] - 0s 823us/step - loss: 0.1751
Epoch 578/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1741
Epoch 579/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1732
Epoch 580/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1725
Epoch 581/1000
13/13 [==============================] - 0s 948us/step - loss: 0.1731
Epoch 582/1000
13/13 [==============================] - 0s 917us/step - loss: 0.1709
Epoch 583/1000
13/13 [==============================] - 0s 926us/step - loss: 0.1727
Epoch 584/1000
13/13 [==============================] - 0s 970us/step - loss: 0.1742
Epoch 585/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1721
Epoch 586/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1730
Epoch 587/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1728
Epoch 588/1000
13/13 [==============================] - 0s 859us/step - loss: 0.1718
Epoch 589/1000
13/13 [==============================] - 0s 859us/step - loss: 0.1710
```

```
Epoch 590/1000
13/13 [==============================] - 0s 906us/step - loss: 0.1787
Epoch 591/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1789
Epoch 592/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1745
Epoch 593/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1775
Epoch 594/1000
13/13 [==============================] - 0s 918us/step - loss: 0.1727
Epoch 595/1000
13/13 [==============================] - 0s 841us/step - loss: 0.1738
Epoch 596/1000
13/13 [==============================] - 0s 819us/step - loss: 0.1746
Epoch 597/1000
13/13 [==============================] - 0s 822us/step - loss: 0.1734
Epoch 598/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1738
Epoch 599/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1707
Epoch 600/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1735
Epoch 601/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1731
Epoch 602/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1727
Epoch 603/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1722
Epoch 604/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1720
Epoch 605/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1747
Epoch 606/1000
13/13 [==============================] - 0s 967us/step - loss: 0.1770
Epoch 607/1000
13/13 [==============================] - 0s 862us/step - loss: 0.1741
Epoch 608/1000
13/13 [==============================] - 0s 860us/step - loss: 0.1748
Epoch 609/1000
13/13 [==============================] - 0s 893us/step - loss: 0.1731
Epoch 610/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1743
Epoch 611/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1725
Epoch 612/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1706
Epoch 613/1000
13/13 [==============================] - 0s 882us/step - loss: 0.1732
```

```
Epoch 614/1000
13/13 [==============================] - 0s 916us/step - loss: 0.1746
Epoch 615/1000
13/13 [==============================] - 0s 896us/step - loss: 0.1729
Epoch 616/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1711
Epoch 617/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1722
Epoch 618/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1802
Epoch 619/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1725
Epoch 620/1000
13/13 [==============================] - 0s 844us/step - loss: 0.1773
Epoch 621/1000
13/13 [==============================] - 0s 845us/step - loss: 0.1710
Epoch 622/1000
13/13 [==============================] - 0s 925us/step - loss: 0.1746
Epoch 623/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1728
Epoch 624/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1709
Epoch 625/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1776
Epoch 626/1000
13/13 [==============================] - 0s 862us/step - loss: 0.1717
Epoch 627/1000
13/13 [==============================] - 0s 843us/step - loss: 0.1728
Epoch 628/1000
13/13 [==============================] - 0s 836us/step - loss: 0.1711
Epoch 629/1000
13/13 [==============================] - 0s 822us/step - loss: 0.1732
Epoch 630/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1719
Epoch 631/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1711
Epoch 632/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1752
Epoch 633/1000
13/13 [==============================] - 0s 931us/step - loss: 0.1731
Epoch 634/1000
13/13 [==============================] - 0s 881us/step - loss: 0.1758
Epoch 635/1000
13/13 [==============================] - 0s 869us/step - loss: 0.1713
Epoch 636/1000
13/13 [==============================] - 0s 865us/step - loss: 0.1744
Epoch 637/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1728
```

```
Epoch 638/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1725
Epoch 639/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1718
Epoch 640/1000
13/13 [==============================] - 0s 874us/step - loss: 0.1732
Epoch 641/1000
13/13 [==============================] - 0s 897us/step - loss: 0.1736
Epoch 642/1000
13/13 [==============================] - 0s 886us/step - loss: 0.1700
Epoch 643/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1705
Epoch 644/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1725
Epoch 645/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1711
Epoch 646/1000
13/13 [==============================] - 0s 975us/step - loss: 0.1723
Epoch 647/1000
13/13 [==============================] - 0s 939us/step - loss: 0.1719
Epoch 648/1000
13/13 [==============================] - 0s 934us/step - loss: 0.1718
Epoch 649/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1740
Epoch 650/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1737
Epoch 651/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1705
Epoch 652/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1699
Epoch 653/1000
13/13 [==============================] - 0s 826us/step - loss: 0.1712
Epoch 654/1000
13/13 [==============================] - 0s 864us/step - loss: 0.1704
Epoch 655/1000
13/13 [==============================] - 0s 834us/step - loss: 0.1705
Epoch 656/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1701
Epoch 657/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1701
Epoch 658/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1739
Epoch 659/1000
13/13 [==============================] - 0s 938us/step - loss: 0.1712
Epoch 660/1000
13/13 [==============================] - 0s 856us/step - loss: 0.1697
Epoch 661/1000
13/13 [==============================] - 0s 876us/step - loss: 0.1718
```

```
Epoch 662/1000
13/13 [==============================] - 0s 825us/step - loss: 0.1720
Epoch 663/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1725
Epoch 664/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1694
Epoch 665/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1700
Epoch 666/1000
13/13 [==============================] - 0s 851us/step - loss: 0.1740
Epoch 667/1000
13/13 [==============================] - 0s 865us/step - loss: 0.1693
Epoch 668/1000
13/13 [==============================] - 0s 847us/step - loss: 0.1722
Epoch 669/1000
13/13 [==============================] - 0s 891us/step - loss: 0.1732
Epoch 670/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1704
Epoch 671/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1696
Epoch 672/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1733
Epoch 673/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1726
Epoch 674/1000
13/13 [==============================] - 0s 878us/step - loss: 0.1740
Epoch 675/1000
13/13 [==============================] - 0s 914us/step - loss: 0.1699
Epoch 676/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1712
Epoch 677/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1711
Epoch 678/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1718
Epoch 679/1000
13/13 [==============================] - 0s 833us/step - loss: 0.1795
Epoch 680/1000
13/13 [==============================] - 0s 818us/step - loss: 0.1709
Epoch 681/1000
13/13 [==============================] - 0s 829us/step - loss: 0.1703
Epoch 682/1000
13/13 [==============================] - 0s 972us/step - loss: 0.1717
Epoch 683/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1758
Epoch 684/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1699
Epoch 685/1000
13/13 [==============================] - 0s 915us/step - loss: 0.1753
```

```
Epoch 686/1000
13/13 [==============================] - 0s 822us/step - loss: 0.1728
Epoch 687/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1733
Epoch 688/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1706
Epoch 689/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1705
Epoch 690/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1698
Epoch 691/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1721
Epoch 692/1000
13/13 [==============================] - 0s 901us/step - loss: 0.1712
Epoch 693/1000
13/13 [==============================] - 0s 971us/step - loss: 0.1716
Epoch 694/1000
13/13 [==============================] - 0s 962us/step - loss: 0.1692
Epoch 695/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1718
Epoch 696/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1704
Epoch 697/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1711
Epoch 698/1000
13/13 [==============================] - 0s 857us/step - loss: 0.1708
Epoch 699/1000
13/13 [==============================] - 0s 841us/step - loss: 0.1702
Epoch 700/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1737
Epoch 701/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1720
Epoch 702/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1701
Epoch 703/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1710
Epoch 704/1000
13/13 [==============================] - 0s 872us/step - loss: 0.1690
Epoch 705/1000
13/13 [==============================] - 0s 865us/step - loss: 0.1719
Epoch 706/1000
13/13 [==============================] - 0s 870us/step - loss: 0.1718
Epoch 707/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1680
Epoch 708/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1756
Epoch 709/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1754
```

```
Epoch 710/1000
13/13 [==============================] - 0s 902us/step - loss: 0.1721
Epoch 711/1000
13/13 [==============================] - 0s 920us/step - loss: 0.1751
Epoch 712/1000
13/13 [==============================] - 0s 916us/step - loss: 0.1714
Epoch 713/1000
13/13 [==============================] - 0s 857us/step - loss: 0.1716
Epoch 714/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1703
Epoch 715/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1704
Epoch 716/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1749
Epoch 717/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1676
Epoch 718/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1713
Epoch 719/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1690
Epoch 720/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1700
Epoch 721/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1713
Epoch 722/1000
13/13 [==============================] - 0s 933us/step - loss: 0.1712
Epoch 723/1000
13/13 [==============================] - 0s 844us/step - loss: 0.1697
Epoch 724/1000
13/13 [==============================] - 0s 852us/step - loss: 0.1718
Epoch 725/1000
13/13 [==============================] - 0s 884us/step - loss: 0.1741
Epoch 726/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1719
Epoch 727/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1716
Epoch 728/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1713
Epoch 729/1000
13/13 [==============================] - 0s 956us/step - loss: 0.1694
Epoch 730/1000
13/13 [==============================] - 0s 914us/step - loss: 0.1764
Epoch 731/1000
13/13 [==============================] - 0s 905us/step - loss: 0.1758
Epoch 732/1000
13/13 [==============================] - 0s 912us/step - loss: 0.1735
Epoch 733/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1700
```

```
Epoch 734/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1698
Epoch 735/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1699
Epoch 736/1000
13/13 [==============================] - 0s 857us/step - loss: 0.1716
Epoch 737/1000
13/13 [==============================] - 0s 925us/step - loss: 0.1701
Epoch 738/1000
13/13 [==============================] - 0s 870us/step - loss: 0.1720
Epoch 739/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1737
Epoch 740/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1730
Epoch 741/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1700
Epoch 742/1000
13/13 [==============================] - 0s 975us/step - loss: 0.1684
Epoch 743/1000
13/13 [==============================] - 0s 951us/step - loss: 0.1713
Epoch 744/1000
13/13 [==============================] - 0s 927us/step - loss: 0.1695
Epoch 745/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1715
Epoch 746/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1690
Epoch 747/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1706
Epoch 748/1000
13/13 [==============================] - 0s 962us/step - loss: 0.1687
Epoch 749/1000
13/13 [==============================] - 0s 858us/step - loss: 0.1694
Epoch 750/1000
13/13 [==============================] - 0s 839us/step - loss: 0.1700
Epoch 751/1000
13/13 [==============================] - 0s 825us/step - loss: 0.1697
Epoch 752/1000
13/13 [==============================] - 0s 966us/step - loss: 0.1696
Epoch 753/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1707
Epoch 754/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1719
Epoch 755/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1716
Epoch 756/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1766
Epoch 757/1000
13/13 [==============================] - 0s 885us/step - loss: 0.1752
```

```
Epoch 758/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1689
Epoch 759/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1709
Epoch 760/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1696
Epoch 761/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1684
Epoch 762/1000
13/13 [==============================] - 0s 909us/step - loss: 0.1731
Epoch 763/1000
13/13 [==============================] - 0s 851us/step - loss: 0.1725
Epoch 764/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1754
Epoch 765/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1697
Epoch 766/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1735
Epoch 767/1000
13/13 [==============================] - 0s 952us/step - loss: 0.1705
Epoch 768/1000
13/13 [==============================] - 0s 874us/step - loss: 0.1699
Epoch 769/1000
13/13 [==============================] - 0s 873us/step - loss: 0.1701
Epoch 770/1000
13/13 [==============================] - 0s 948us/step - loss: 0.1693
Epoch 771/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1708
Epoch 772/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1693
Epoch 773/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1697
Epoch 774/1000
13/13 [==============================] - 0s 939us/step - loss: 0.1712
Epoch 775/1000
13/13 [==============================] - 0s 908us/step - loss: 0.1704
Epoch 776/1000
13/13 [==============================] - 0s 909us/step - loss: 0.1681
Epoch 777/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1704
Epoch 778/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1721
Epoch 779/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1706
Epoch 780/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1747
Epoch 781/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1722
```

```
Epoch 782/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1714
Epoch 783/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1697
Epoch 784/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1691
Epoch 785/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1710
Epoch 786/1000
13/13 [==============================] - 0s 822us/step - loss: 0.1770
Epoch 787/1000
13/13 [==============================] - 0s 810us/step - loss: 0.1710
Epoch 788/1000
13/13 [==============================] - 0s 807us/step - loss: 0.1672
Epoch 789/1000
13/13 [==============================] - 0s 851us/step - loss: 0.1706
Epoch 790/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1718
Epoch 791/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1678
Epoch 792/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1691
Epoch 793/1000
13/13 [==============================] - 0s 836us/step - loss: 0.1715
Epoch 794/1000
13/13 [==============================] - 0s 897us/step - loss: 0.1784
Epoch 795/1000
13/13 [==============================] - 0s 859us/step - loss: 0.1659
Epoch 796/1000
13/13 [==============================] - 0s 998us/step - loss: 0.1756
Epoch 797/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1708
Epoch 798/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1706
Epoch 799/1000
13/13 [==============================] - 0s 957us/step - loss: 0.1695
Epoch 800/1000
13/13 [==============================] - 0s 929us/step - loss: 0.1668
Epoch 801/1000
13/13 [==============================] - 0s 922us/step - loss: 0.1703
Epoch 802/1000
13/13 [==============================] - 0s 872us/step - loss: 0.1683
Epoch 803/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1704
Epoch 804/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1701
Epoch 805/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1691
```

```
Epoch 806/1000
13/13 [==============================] - 0s 941us/step - loss: 0.1712
Epoch 807/1000
13/13 [==============================] - 0s 886us/step - loss: 0.1679
Epoch 808/1000
13/13 [==============================] - 0s 830us/step - loss: 0.1688
Epoch 809/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1704
Epoch 810/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1699
Epoch 811/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1693
Epoch 812/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1678
Epoch 813/1000
13/13 [==============================] - 0s 901us/step - loss: 0.1694
Epoch 814/1000
13/13 [==============================] - 0s 861us/step - loss: 0.1676
Epoch 815/1000
13/13 [==============================] - 0s 851us/step - loss: 0.1698
Epoch 816/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1717
Epoch 817/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1712
Epoch 818/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1681
Epoch 819/1000
13/13 [==============================] - 0s 879us/step - loss: 0.1723
Epoch 820/1000
13/13 [==============================] - 0s 838us/step - loss: 0.1733
Epoch 821/1000
13/13 [==============================] - 0s 825us/step - loss: 0.1692
Epoch 822/1000
13/13 [==============================] - 0s 837us/step - loss: 0.1745
Epoch 823/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1762
Epoch 824/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1713
Epoch 825/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1697
Epoch 826/1000
13/13 [==============================] - 0s 870us/step - loss: 0.1698
Epoch 827/1000
13/13 [==============================] - 0s 845us/step - loss: 0.1720
Epoch 828/1000
13/13 [==============================] - 0s 879us/step - loss: 0.1696
Epoch 829/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1707
```

```
Epoch 830/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1693
Epoch 831/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1691
Epoch 832/1000
13/13 [==============================] - 0s 974us/step - loss: 0.1689
Epoch 833/1000
13/13 [==============================] - 0s 948us/step - loss: 0.1716
Epoch 834/1000
13/13 [==============================] - 0s 933us/step - loss: 0.1669
Epoch 835/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1683
Epoch 836/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1673
Epoch 837/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1684
Epoch 838/1000
13/13 [==============================] - 0s 946us/step - loss: 0.1688
Epoch 839/1000
13/13 [==============================] - 0s 933us/step - loss: 0.1695
Epoch 840/1000
13/13 [==============================] - 0s 933us/step - loss: 0.1689
Epoch 841/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1702
Epoch 842/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1711
Epoch 843/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1689
Epoch 844/1000
13/13 [==============================] - 0s 974us/step - loss: 0.1682
Epoch 845/1000
13/13 [==============================] - 0s 830us/step - loss: 0.1694
Epoch 846/1000
13/13 [==============================] - 0s 829us/step - loss: 0.1678
Epoch 847/1000
13/13 [==============================] - 0s 833us/step - loss: 0.1693
Epoch 848/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1707
Epoch 849/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1699
Epoch 850/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1683
Epoch 851/1000
13/13 [==============================] - 0s 889us/step - loss: 0.1688
Epoch 852/1000
13/13 [==============================] - 0s 840us/step - loss: 0.1751
Epoch 853/1000
13/13 [==============================] - 0s 825us/step - loss: 0.1707
```

```
Epoch 854/1000
13/13 [==============================] - 0s 829us/step - loss: 0.1680
Epoch 855/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1688
Epoch 856/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1690
Epoch 857/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1676
Epoch 858/1000
13/13 [==============================] - 0s 834us/step - loss: 0.1720
Epoch 859/1000
13/13 [==============================] - 0s 825us/step - loss: 0.1691
Epoch 860/1000
13/13 [==============================] - 0s 823us/step - loss: 0.1692
Epoch 861/1000
13/13 [==============================] - 0s 810us/step - loss: 0.1705
Epoch 862/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1675
Epoch 863/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1715
Epoch 864/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1684
Epoch 865/1000
13/13 [==============================] - 0s 860us/step - loss: 0.1703
Epoch 866/1000
13/13 [==============================] - 0s 823us/step - loss: 0.1702
Epoch 867/1000
13/13 [==============================] - 0s 822us/step - loss: 0.1695
Epoch 868/1000
13/13 [==============================] - 0s 826us/step - loss: 0.1728
Epoch 869/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1682
Epoch 870/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1681
Epoch 871/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1684
Epoch 872/1000
13/13 [==============================] - 0s 946us/step - loss: 0.1680
Epoch 873/1000
13/13 [==============================] - 0s 907us/step - loss: 0.1720
Epoch 874/1000
13/13 [==============================] - 0s 906us/step - loss: 0.1705
Epoch 875/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1686
Epoch 876/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1676
Epoch 877/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1750
```

```
Epoch 878/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1728
Epoch 879/1000
13/13 [==============================] - 0s 868us/step - loss: 0.1733
Epoch 880/1000
13/13 [==============================] - 0s 836us/step - loss: 0.1690
Epoch 881/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1721
Epoch 882/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1754
Epoch 883/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1727
Epoch 884/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1697
Epoch 885/1000
13/13 [==============================] - 0s 819us/step - loss: 0.1670
Epoch 886/1000
13/13 [==============================] - 0s 829us/step - loss: 0.1675
Epoch 887/1000
13/13 [==============================] - 0s 863us/step - loss: 0.1723
Epoch 888/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1701
Epoch 889/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1677
Epoch 890/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1712
Epoch 891/1000
13/13 [==============================] - 0s 946us/step - loss: 0.1684
Epoch 892/1000
13/13 [==============================] - 0s 914us/step - loss: 0.1695
Epoch 893/1000
13/13 [==============================] - 0s 959us/step - loss: 0.1680
Epoch 894/1000
13/13 [==============================] - 0s 898us/step - loss: 0.1694
Epoch 895/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1683
Epoch 896/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1694
Epoch 897/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1714
Epoch 898/1000
13/13 [==============================] - 0s 865us/step - loss: 0.1682
Epoch 899/1000
13/13 [==============================] - 0s 841us/step - loss: 0.1704
Epoch 900/1000
13/13 [==============================] - 0s 838us/step - loss: 0.1664
Epoch 901/1000
13/13 [==============================] - 0s 862us/step - loss: 0.1683
```

```
Epoch 902/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1682
Epoch 903/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1669
Epoch 904/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1688
Epoch 905/1000
13/13 [==============================] - 0s 888us/step - loss: 0.1686
Epoch 906/1000
13/13 [==============================] - 0s 837us/step - loss: 0.1739
Epoch 907/1000
13/13 [==============================] - 0s 858us/step - loss: 0.1693
Epoch 908/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1689
Epoch 909/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1673
Epoch 910/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1700
Epoch 911/1000
13/13 [==============================] - 0s 906us/step - loss: 0.1672
Epoch 912/1000
13/13 [==============================] - 0s 804us/step - loss: 0.1672
Epoch 913/1000
13/13 [==============================] - 0s 795us/step - loss: 0.1702
Epoch 914/1000
13/13 [==============================] - 0s 832us/step - loss: 0.1662
Epoch 915/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1716
Epoch 916/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1669
Epoch 917/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1704
Epoch 918/1000
13/13 [==============================] - 0s 920us/step - loss: 0.1659
Epoch 919/1000
13/13 [==============================] - 0s 804us/step - loss: 0.1725
Epoch 920/1000
13/13 [==============================] - 0s 806us/step - loss: 0.1718
Epoch 921/1000
13/13 [==============================] - 0s 854us/step - loss: 0.1670
Epoch 922/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1695
Epoch 923/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1670
Epoch 924/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1672
Epoch 925/1000
13/13 [==============================] - 0s 873us/step - loss: 0.1685
```

```
Epoch 926/1000
13/13 [==============================] - 0s 830us/step - loss: 0.1681
Epoch 927/1000
13/13 [==============================] - 0s 807us/step - loss: 0.1698
Epoch 928/1000
13/13 [==============================] - 0s 793us/step - loss: 0.1660
Epoch 929/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1704
Epoch 930/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1678
Epoch 931/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1703
Epoch 932/1000
13/13 [==============================] - 0s 941us/step - loss: 0.1700
Epoch 933/1000
13/13 [==============================] - 0s 923us/step - loss: 0.1699
Epoch 934/1000
13/13 [==============================] - 0s 918us/step - loss: 0.1691
Epoch 935/1000
13/13 [==============================] - 0s 925us/step - loss: 0.1689
Epoch 936/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1680
Epoch 937/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1701
Epoch 938/1000
13/13 [==============================] - 0s 960us/step - loss: 0.1681
Epoch 939/1000
13/13 [==============================] - 0s 910us/step - loss: 0.1693
Epoch 940/1000
13/13 [==============================] - 0s 917us/step - loss: 0.1703
Epoch 941/1000
13/13 [==============================] - 0s 909us/step - loss: 0.1674
Epoch 942/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1667
Epoch 943/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1682
Epoch 944/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1706
Epoch 945/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1679
Epoch 946/1000
13/13 [==============================] - 0s 853us/step - loss: 0.1647
Epoch 947/1000
13/13 [==============================] - 0s 849us/step - loss: 0.1759
Epoch 948/1000
13/13 [==============================] - 0s 853us/step - loss: 0.1712
Epoch 949/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1679
```

```
Epoch 950/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1669
Epoch 951/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1733
Epoch 952/1000
13/13 [==============================] - 0s 831us/step - loss: 0.1662
Epoch 953/1000
13/13 [==============================] - 0s 882us/step - loss: 0.1751
Epoch 954/1000
13/13 [==============================] - 0s 872us/step - loss: 0.1705
Epoch 955/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1661
Epoch 956/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1658
Epoch 957/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1676
Epoch 958/1000
13/13 [==============================] - 0s 946us/step - loss: 0.1718
Epoch 959/1000
13/13 [==============================] - 0s 875us/step - loss: 0.1644
Epoch 960/1000
13/13 [==============================] - 0s 864us/step - loss: 0.1697
Epoch 961/1000
13/13 [==============================] - 0s 866us/step - loss: 0.1654
Epoch 962/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1667
Epoch 963/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1757
Epoch 964/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1661
Epoch 965/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1713
Epoch 966/1000
13/13 [==============================] - 0s 844us/step - loss: 0.1671
Epoch 967/1000
13/13 [==============================] - 0s 855us/step - loss: 0.1697
Epoch 968/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1716
Epoch 969/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1688
Epoch 970/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1672
Epoch 971/1000
13/13 [==============================] - 0s 951us/step - loss: 0.1664
Epoch 972/1000
13/13 [==============================] - 0s 848us/step - loss: 0.1684
Epoch 973/1000
13/13 [==============================] - 0s 834us/step - loss: 0.1660
```

```
Epoch 974/1000
13/13 [==============================] - 0s 815us/step - loss: 0.1678
Epoch 975/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1675
Epoch 976/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1710
Epoch 977/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1722
Epoch 978/1000
13/13 [==============================] - 0s 891us/step - loss: 0.1648
Epoch 979/1000
13/13 [==============================] - 0s 830us/step - loss: 0.1716
Epoch 980/1000
13/13 [==============================] - 0s 832us/step - loss: 0.1666
Epoch 981/1000
13/13 [==============================] - 0s 833us/step - loss: 0.1666
Epoch 982/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1696
Epoch 983/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1703
Epoch 984/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1655
Epoch 985/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1658
Epoch 986/1000
13/13 [==============================] - 0s 952us/step - loss: 0.1691
Epoch 987/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1665
Epoch 988/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1680
Epoch 989/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1682
Epoch 990/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1664
Epoch 991/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1682
Epoch 992/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1685
Epoch 993/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1672
Epoch 994/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1660
Epoch 995/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1705
Epoch 996/1000
13/13 [==============================] - 0s 995us/step - loss: 0.1678
Epoch 997/1000
13/13 [==============================] - 0s 890us/step - loss: 0.1689
```

```
Epoch 998/1000
13/13 [==============================] - 0s 922us/step - loss: 0.1701
Epoch 999/1000
13/13 [==============================] - 0s 926us/step - loss: 0.1711
Epoch 1000/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1628
```

[28]: `<keras.callbacks.History at 0x7f7740370790>`

[29]:
```python
# BEGIN UNIT TEST
model_s.summary()

model_s_test(model_s, classes, X_train.shape[1])
# END UNIT TEST
```

```
Model: "Simple"

_____
 Layer (type)                Output Shape              Param #
=================================================================
 dense_3 (Dense)             (None, 6)                 18


 dense_4 (Dense)             (None, 6)                 42


=================================================================
Total params: 60
Trainable params: 60
Non-trainable params: 0
_____
```
All tests passed!

Click for hints

Summary should match this (layer instance names may increment)

```
Model: "Simple"

_____
Layer (type)                 Output Shape              Param #
=================================================================
L1 (Dense)                   (None, 6)                 18
_____
L2 (Dense)                   (None, 6)                 42
=================================================================
Total params: 60
Trainable params: 60
Non-trainable params: 0
_____
```

Click for more hints

```python
tf.random.set_seed(1234)
```

```
    model_s = Sequential(
        [
            Dense(6, activation = 'relu', name="L1"),          # @REPLACE
            Dense(classes, activation = 'linear', name="L2")    # @REPLACE
        ], name = "Simple"
    )
    model_s.compile(
        loss=tf.keras.losses.SparseCategoricalCrossentropy(from_logits=True),     # @REPLACE
        optimizer=tf.keras.optimizers.Adam(0.01),      # @REPLACE
    )

    model_s.fit(
        X_train,y_train,
        epochs=1000
    )
```

[30]:
```
#make a model for plotting routines to call
model_predict_s = lambda Xl: np.argmax(tf.nn.softmax(model_s.predict(Xl)).
 ↪numpy(),axis=1)
plt_nn(model_predict_s,X_train,y_train, classes, X_cv, y_cv, suptitle="Simple␣
 ↪Model")
```

```
Canvas(toolbar=Toolbar(toolitems=[('Home', 'Reset original view', 'home', 'home'), ('Back', 'Ba
```

This simple models does pretty well. Let's calculate the classification error.

[31]:
```
training_cerr_simple = eval_cat_err(y_train, model_predict_s(X_train))
cv_cerr_simple = eval_cat_err(y_cv, model_predict_s(X_cv))
print(f"categorization error, training, simple model, {training_cerr_simple:0.
 ↪3f}, complex model: {training_cerr_complex:0.3f}" )
print(f"categorization error, cv,       simple model, {cv_cerr_simple:0.3f},␣
 ↪complex model: {cv_cerr_complex:0.3f}" )
```

```
categorization error, training, simple model, 0.062, complex model: 0.003
categorization error, cv,       simple model, 0.087, complex model: 0.122
```

Our simple model has a little higher classification error on training data but does better on cross-validation data than the more complex model.

6 - Regularization As in the case of polynomial regression, one can apply regularization to moderate the impact of a more complex model. Let's try this below.

Exercise 5

Reconstruct your complex model, but this time include regularization. Below, compose a three-layer model: * Dense layer with 120 units, relu activation, `kernel_regularizer=tf.keras.regularizers.l2(0.1)` * Dense layer with 40 units, relu activation, `kernel_regularizer=tf.keras.regularizers.l2(0.1)` * Dense layer with 6 units and a linear activation. Compile using * loss with `SparseCategoricalCrossentropy`, remember to use `from_logits=True` * Adam optimizer with learning rate of 0.01.

```
[32]: # UNQ_C5
      # GRADED CELL: model_r

      tf.random.set_seed(1234)
      model_r = Sequential(
          [
              ### START CODE HERE ###
              Dense(120, activation='relu', kernel_regularizer=tf.keras.regularizers.
      →l2(0.1)),
              Dense(40, activation='relu', kernel_regularizer=tf.keras.regularizers.
      →l2(0.1)),
              Dense(6, activation='linear'),
          ], name="ComplexRegularized"
      )
      model_r.compile(
          ### START CODE HERE ###
          loss=tf.keras.losses.SparseCategoricalCrossentropy(from_logits=True),
          optimizer=tf.keras.optimizers.Adam(learning_rate=0.01),
          ### START CODE HERE ###
      )
```

```
[33]: # BEGIN UNIT TEST
      model_r.fit(
          X_train, y_train,
          epochs=1000
      )
      # END UNIT TEST
```

```
Epoch 1/1000
13/13 [==============================] - 0s 1ms/step - loss: 4.4464
Epoch 2/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.7086
Epoch 3/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.3465
Epoch 4/1000
13/13 [==============================] - 0s 2ms/step - loss: 1.0870
Epoch 5/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.0137
Epoch 6/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.9718
Epoch 7/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.9481
Epoch 8/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.8934
Epoch 9/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8171
Epoch 10/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.7715
Epoch 11/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7611
Epoch 12/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.7521
Epoch 13/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7430
Epoch 14/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7474
Epoch 15/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7045
Epoch 16/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.7056
Epoch 17/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7182
Epoch 18/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7126
Epoch 19/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6868
Epoch 20/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6733
Epoch 21/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6572
Epoch 22/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6630
Epoch 23/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6508
Epoch 24/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6395
Epoch 25/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.6603
Epoch 26/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7651
Epoch 27/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6369
Epoch 28/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6122
Epoch 29/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6002
Epoch 30/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6216
Epoch 31/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6096
Epoch 32/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6260
Epoch 33/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6151
Epoch 34/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.6551
Epoch 35/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6538
Epoch 36/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6324
Epoch 37/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5940
Epoch 38/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5739
Epoch 39/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5686
Epoch 40/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5697
Epoch 41/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5845
Epoch 42/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5564
Epoch 43/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5791
Epoch 44/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5855
Epoch 45/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5822
Epoch 46/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5683
Epoch 47/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5278
Epoch 48/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5762
Epoch 49/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5532
Epoch 50/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5313
Epoch 51/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5409
Epoch 52/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5302
Epoch 53/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5362
Epoch 54/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5209
Epoch 55/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5680
Epoch 56/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5131
Epoch 57/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5216
Epoch 58/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.5181
Epoch 59/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5470
Epoch 60/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5524
Epoch 61/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5482
Epoch 62/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5393
Epoch 63/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5135
Epoch 64/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5322
Epoch 65/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5148
Epoch 66/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5021
Epoch 67/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5041
Epoch 68/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5086
Epoch 69/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5108
Epoch 70/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5156
Epoch 71/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5115
Epoch 72/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5003
Epoch 73/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4989
Epoch 74/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5097
Epoch 75/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5001
Epoch 76/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5060
Epoch 77/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4977
Epoch 78/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5227
Epoch 79/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5380
Epoch 80/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5101
Epoch 81/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5247
Epoch 82/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4910
Epoch 83/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4799
Epoch 84/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4673
Epoch 85/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4877
Epoch 86/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4816
Epoch 87/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4969
Epoch 88/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4812
Epoch 89/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4776
Epoch 90/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4696
Epoch 91/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4759
Epoch 92/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4731
Epoch 93/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4599
Epoch 94/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4623
Epoch 95/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4669
Epoch 96/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4545
Epoch 97/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4709
Epoch 98/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4669
Epoch 99/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4961
Epoch 100/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4954
Epoch 101/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4874
Epoch 102/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4759
Epoch 103/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4739
Epoch 104/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4682
Epoch 105/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5125
Epoch 106/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4548
Epoch 107/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4610
Epoch 108/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4702
Epoch 109/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4565
Epoch 110/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4568
Epoch 111/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4550
Epoch 112/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4541
Epoch 113/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4450
Epoch 114/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4411
Epoch 115/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4398
Epoch 116/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4482
Epoch 117/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4724
Epoch 118/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4591
Epoch 119/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4686
Epoch 120/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4736
Epoch 121/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5020
Epoch 122/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4630
Epoch 123/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4543
Epoch 124/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4465
Epoch 125/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4328
Epoch 126/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4386
Epoch 127/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4468
Epoch 128/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4348
Epoch 129/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4419
Epoch 130/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4371
Epoch 131/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4542
Epoch 132/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4331
Epoch 133/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4236
Epoch 134/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4470
Epoch 135/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4431
Epoch 136/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4460
Epoch 137/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4281
Epoch 138/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4470
Epoch 139/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4480
Epoch 140/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4627
Epoch 141/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4332
Epoch 142/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4201
Epoch 143/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4340
Epoch 144/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4382
Epoch 145/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4264
Epoch 146/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4260
Epoch 147/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4603
Epoch 148/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4396
Epoch 149/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4239
Epoch 150/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4208
Epoch 151/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4169
Epoch 152/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4201
Epoch 153/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4391
Epoch 154/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.4230
Epoch 155/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4316
Epoch 156/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4312
Epoch 157/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4280
Epoch 158/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4210
Epoch 159/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4066
Epoch 160/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4302
Epoch 161/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4433
Epoch 162/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4284
Epoch 163/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4102
Epoch 164/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4265
Epoch 165/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4454
Epoch 166/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4595
Epoch 167/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4779
Epoch 168/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4529
Epoch 169/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4328
Epoch 170/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4336
Epoch 171/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4206
Epoch 172/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4214
Epoch 173/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4343
Epoch 174/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4415
Epoch 175/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4200
Epoch 176/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4431
Epoch 177/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4323
Epoch 178/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4162
Epoch 179/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4214
Epoch 180/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4130
Epoch 181/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4324
Epoch 182/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4232
Epoch 183/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4093
Epoch 184/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4030
Epoch 185/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4055
Epoch 186/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4087
Epoch 187/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4134
Epoch 188/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4165
Epoch 189/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3974
Epoch 190/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3971
Epoch 191/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4116
Epoch 192/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4153
Epoch 193/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4132
Epoch 194/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4158
Epoch 195/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4026
Epoch 196/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3953
Epoch 197/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4191
Epoch 198/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3963
Epoch 199/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4080
Epoch 200/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4032
Epoch 201/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4268
Epoch 202/1000
```

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13/13 [==============================] - 0s 2ms/step - loss: 0.3954
Epoch 203/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3980
Epoch 204/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4088
Epoch 205/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4571
Epoch 206/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4315
Epoch 207/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4097
Epoch 208/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4166
Epoch 209/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4393
Epoch 210/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4124
Epoch 211/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4216
Epoch 212/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4118
Epoch 213/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4038
Epoch 214/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4036
Epoch 215/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3945
Epoch 216/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4068
Epoch 217/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3940
Epoch 218/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4194
Epoch 219/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3976
Epoch 220/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3994
Epoch 221/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3873
Epoch 222/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4067
Epoch 223/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4034
Epoch 224/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4393
Epoch 225/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4334
Epoch 226/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4213
Epoch 227/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4377
Epoch 228/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3912
Epoch 229/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4028
Epoch 230/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4112
Epoch 231/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4021
Epoch 232/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4107
Epoch 233/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3893
Epoch 234/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3889
Epoch 235/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3881
Epoch 236/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3966
Epoch 237/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3954
Epoch 238/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4168
Epoch 239/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4049
Epoch 240/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3863
Epoch 241/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3890
Epoch 242/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3908
Epoch 243/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3888
Epoch 244/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3984
Epoch 245/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3993
Epoch 246/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4078
Epoch 247/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3814
Epoch 248/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3897
Epoch 249/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3995
Epoch 250/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3910
Epoch 251/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4142
Epoch 252/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4036
Epoch 253/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3950
Epoch 254/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4073
Epoch 255/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4041
Epoch 256/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3808
Epoch 257/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4020
Epoch 258/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3885
Epoch 259/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3947
Epoch 260/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3841
Epoch 261/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4000
Epoch 262/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4665
Epoch 263/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4367
Epoch 264/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3957
Epoch 265/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3989
Epoch 266/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4251
Epoch 267/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4346
Epoch 268/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4114
Epoch 269/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3832
Epoch 270/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3787
Epoch 271/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3874
Epoch 272/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3891
Epoch 273/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4039
Epoch 274/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3776
Epoch 275/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3903
Epoch 276/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3870
Epoch 277/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3825
Epoch 278/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3812
Epoch 279/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4026
Epoch 280/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3938
Epoch 281/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3764
Epoch 282/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3800
Epoch 283/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3876
Epoch 284/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3853
Epoch 285/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4070
Epoch 286/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3956
Epoch 287/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3915
Epoch 288/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3877
Epoch 289/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3760
Epoch 290/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3892
Epoch 291/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3911
Epoch 292/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3697
Epoch 293/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3800
Epoch 294/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4007
Epoch 295/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4066
Epoch 296/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3768
Epoch 297/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3841
Epoch 298/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3884
Epoch 299/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3926
Epoch 300/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4250
Epoch 301/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3915
Epoch 302/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3894
Epoch 303/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3858
Epoch 304/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3804
Epoch 305/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3810
Epoch 306/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3883
Epoch 307/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3922
Epoch 308/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3879
Epoch 309/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3801
Epoch 310/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3715
Epoch 311/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3690
Epoch 312/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3733
Epoch 313/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3863
Epoch 314/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3843
Epoch 315/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3822
Epoch 316/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3789
Epoch 317/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3808
Epoch 318/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3742
Epoch 319/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3791
Epoch 320/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3836
Epoch 321/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3935
Epoch 322/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.3927
Epoch 323/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4023
Epoch 324/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4109
Epoch 325/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3989
Epoch 326/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3860
Epoch 327/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3807
Epoch 328/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3919
Epoch 329/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3763
Epoch 330/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3669
Epoch 331/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3715
Epoch 332/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3724
Epoch 333/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4101
Epoch 334/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3930
Epoch 335/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3933
Epoch 336/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3975
Epoch 337/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4038
Epoch 338/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3737
Epoch 339/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3719
Epoch 340/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3868
Epoch 341/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3792
Epoch 342/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3749
Epoch 343/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3693
Epoch 344/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3644
Epoch 345/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3633
Epoch 346/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3662
Epoch 347/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3888
Epoch 348/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4182
Epoch 349/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3776
Epoch 350/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4027
Epoch 351/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3697
Epoch 352/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3903
Epoch 353/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3757
Epoch 354/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3691
Epoch 355/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3733
Epoch 356/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3651
Epoch 357/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3814
Epoch 358/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3961
Epoch 359/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3892
Epoch 360/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3938
Epoch 361/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4104
Epoch 362/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4556
Epoch 363/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4061
Epoch 364/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3714
Epoch 365/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3674
Epoch 366/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3638
Epoch 367/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3693
Epoch 368/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3912
Epoch 369/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3991
Epoch 370/1000
```

```
13/13 [==============================] - 0s 4ms/step - loss: 0.3732
Epoch 371/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3608
Epoch 372/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3611
Epoch 373/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3791
Epoch 374/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3565
Epoch 375/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3797
Epoch 376/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3772
Epoch 377/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3616
Epoch 378/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3748
Epoch 379/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3832
Epoch 380/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3814
Epoch 381/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4119
Epoch 382/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3712
Epoch 383/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3780
Epoch 384/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3642
Epoch 385/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3681
Epoch 386/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3574
Epoch 387/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3764
Epoch 388/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3717
Epoch 389/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3674
Epoch 390/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3531
Epoch 391/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3664
Epoch 392/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3819
Epoch 393/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3605
Epoch 394/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3635
Epoch 395/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3932
Epoch 396/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3799
Epoch 397/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3915
Epoch 398/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3771
Epoch 399/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3753
Epoch 400/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3727
Epoch 401/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3584
Epoch 402/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3613
Epoch 403/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3600
Epoch 404/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3617
Epoch 405/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3545
Epoch 406/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3600
Epoch 407/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3698
Epoch 408/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3630
Epoch 409/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3818
Epoch 410/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3842
Epoch 411/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3936
Epoch 412/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3794
Epoch 413/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3626
Epoch 414/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3576
Epoch 415/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3730
Epoch 416/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3806
Epoch 417/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3915
Epoch 418/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3629
Epoch 419/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3673
Epoch 420/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3534
Epoch 421/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3874
Epoch 422/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3942
Epoch 423/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3729
Epoch 424/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3723
Epoch 425/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3682
Epoch 426/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3655
Epoch 427/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3641
Epoch 428/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3707
Epoch 429/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3673
Epoch 430/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3631
Epoch 431/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3523
Epoch 432/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3592
Epoch 433/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3893
Epoch 434/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3961
Epoch 435/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4097
Epoch 436/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3961
Epoch 437/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3837
Epoch 438/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3836
Epoch 439/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3501
Epoch 440/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3474
Epoch 441/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3626
Epoch 442/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.3807
Epoch 443/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3725
Epoch 444/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3662
Epoch 445/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3735
Epoch 446/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3537
Epoch 447/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3685
Epoch 448/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3609
Epoch 449/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3533
Epoch 450/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3551
Epoch 451/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3492
Epoch 452/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3630
Epoch 453/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3763
Epoch 454/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3718
Epoch 455/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3727
Epoch 456/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3628
Epoch 457/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3558
Epoch 458/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3812
Epoch 459/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3643
Epoch 460/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3624
Epoch 461/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3632
Epoch 462/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3509
Epoch 463/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3559
Epoch 464/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3718
Epoch 465/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3495
Epoch 466/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3765
Epoch 467/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3667
Epoch 468/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4002
Epoch 469/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4147
Epoch 470/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3473
Epoch 471/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3688
Epoch 472/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4113
Epoch 473/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4088
Epoch 474/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3998
Epoch 475/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3723
Epoch 476/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3604
Epoch 477/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3805
Epoch 478/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3670
Epoch 479/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3594
Epoch 480/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3609
Epoch 481/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3550
Epoch 482/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3755
Epoch 483/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3802
Epoch 484/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3782
Epoch 485/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3808
Epoch 486/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3564
Epoch 487/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3470
Epoch 488/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3539
Epoch 489/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3401
Epoch 490/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3561
Epoch 491/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3693
Epoch 492/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3690
Epoch 493/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3510
Epoch 494/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3548
Epoch 495/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3525
Epoch 496/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3736
Epoch 497/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4008
Epoch 498/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3497
Epoch 499/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3444
Epoch 500/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3610
Epoch 501/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3546
Epoch 502/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3586
Epoch 503/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3814
Epoch 504/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3645
Epoch 505/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3684
Epoch 506/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3834
Epoch 507/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3581
Epoch 508/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3402
Epoch 509/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3503
Epoch 510/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3488
Epoch 511/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3514
Epoch 512/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3611
Epoch 513/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3482
Epoch 514/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3461
Epoch 515/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3535
Epoch 516/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3595
Epoch 517/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3676
Epoch 518/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3638
Epoch 519/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3670
Epoch 520/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3616
Epoch 521/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3475
Epoch 522/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3659
Epoch 523/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3748
Epoch 524/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3416
Epoch 525/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3484
Epoch 526/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3559
Epoch 527/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3420
Epoch 528/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3476
Epoch 529/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3793
Epoch 530/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3642
Epoch 531/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3761
Epoch 532/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3456
Epoch 533/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3398
Epoch 534/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3614
Epoch 535/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3618
Epoch 536/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3422
Epoch 537/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4039
Epoch 538/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3591
Epoch 539/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3597
Epoch 540/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3934
Epoch 541/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4010
Epoch 542/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3746
Epoch 543/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3709
Epoch 544/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3576
Epoch 545/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3510
Epoch 546/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3669
Epoch 547/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3648
Epoch 548/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3654
Epoch 549/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3436
Epoch 550/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3411
Epoch 551/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3460
Epoch 552/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3460
Epoch 553/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3396
Epoch 554/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3513
Epoch 555/1000
13/13 [==============================] - 0s 5ms/step - loss: 0.3890
Epoch 556/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3884
Epoch 557/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3706
Epoch 558/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3578
Epoch 559/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3826
Epoch 560/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3486
Epoch 561/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3443
Epoch 562/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3528
Epoch 563/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3515
Epoch 564/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3615
Epoch 565/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3448
Epoch 566/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3620
Epoch 567/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3439
Epoch 568/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3493
Epoch 569/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3499
Epoch 570/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3386
Epoch 571/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3667
Epoch 572/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3514
Epoch 573/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3500
Epoch 574/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3619
Epoch 575/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3435
Epoch 576/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3396
Epoch 577/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3557
Epoch 578/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4221
Epoch 579/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3583
Epoch 580/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3376
Epoch 581/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3628
Epoch 582/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3540
Epoch 583/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3571
Epoch 584/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3818
Epoch 585/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3954
Epoch 586/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.3669
Epoch 587/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3536
Epoch 588/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3407
Epoch 589/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3348
Epoch 590/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3374
Epoch 591/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3489
Epoch 592/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3452
Epoch 593/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3429
Epoch 594/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3425
Epoch 595/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4209
Epoch 596/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3978
Epoch 597/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3565
Epoch 598/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3443
Epoch 599/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3419
Epoch 600/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3529
Epoch 601/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3345
Epoch 602/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3436
Epoch 603/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3594
Epoch 604/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3504
Epoch 605/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3590
Epoch 606/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3738
Epoch 607/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3654
Epoch 608/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3516
Epoch 609/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3480
Epoch 610/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3599
Epoch 611/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3539
Epoch 612/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3668
Epoch 613/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3593
Epoch 614/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3483
Epoch 615/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3536
Epoch 616/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3456
Epoch 617/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3287
Epoch 618/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3673
Epoch 619/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4033
Epoch 620/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3884
Epoch 621/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3619
Epoch 622/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3834
Epoch 623/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3413
Epoch 624/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3359
Epoch 625/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3319
Epoch 626/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3425
Epoch 627/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3567
Epoch 628/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3715
Epoch 629/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3719
Epoch 630/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3774
Epoch 631/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3697
Epoch 632/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3777
Epoch 633/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3753
Epoch 634/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3749
Epoch 635/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3667
Epoch 636/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3486
Epoch 637/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3488
Epoch 638/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3443
Epoch 639/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3455
Epoch 640/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3583
Epoch 641/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3428
Epoch 642/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3522
Epoch 643/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3642
Epoch 644/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3473
Epoch 645/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3546
Epoch 646/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3543
Epoch 647/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3561
Epoch 648/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3643
Epoch 649/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3590
Epoch 650/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3484
Epoch 651/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3427
Epoch 652/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3329
Epoch 653/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3478
Epoch 654/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3550
Epoch 655/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3478
Epoch 656/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3361
Epoch 657/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3457
Epoch 658/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3430
Epoch 659/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3480
Epoch 660/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3667
Epoch 661/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3403
Epoch 662/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3545
Epoch 663/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3889
Epoch 664/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3568
Epoch 665/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3541
Epoch 666/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3520
Epoch 667/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3340
Epoch 668/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3299
Epoch 669/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3509
Epoch 670/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3352
Epoch 671/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3466
Epoch 672/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3784
Epoch 673/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4029
Epoch 674/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4009
Epoch 675/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3426
Epoch 676/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3406
Epoch 677/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3369
Epoch 678/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3356
Epoch 679/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3463
Epoch 680/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3406
Epoch 681/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3549
Epoch 682/1000
```

```
13/13 [==============================] - 0s 4ms/step - loss: 0.3399
Epoch 683/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3363
Epoch 684/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3415
Epoch 685/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3470
Epoch 686/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3487
Epoch 687/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3424
Epoch 688/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3321
Epoch 689/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3976
Epoch 690/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3724
Epoch 691/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3471
Epoch 692/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3554
Epoch 693/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3445
Epoch 694/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3483
Epoch 695/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3390
Epoch 696/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3378
Epoch 697/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3355
Epoch 698/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3517
Epoch 699/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3456
Epoch 700/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3493
Epoch 701/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3460
Epoch 702/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3256
Epoch 703/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3269
Epoch 704/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3510
Epoch 705/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3470
Epoch 706/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3533
Epoch 707/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3518
Epoch 708/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3458
Epoch 709/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3581
Epoch 710/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3513
Epoch 711/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3361
Epoch 712/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3854
Epoch 713/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3573
Epoch 714/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3398
Epoch 715/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3291
Epoch 716/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3360
Epoch 717/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3615
Epoch 718/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3587
Epoch 719/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4233
Epoch 720/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4165
Epoch 721/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3999
Epoch 722/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3667
Epoch 723/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3688
Epoch 724/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3474
Epoch 725/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3534
Epoch 726/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3492
Epoch 727/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3512
Epoch 728/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3524
Epoch 729/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3441
Epoch 730/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3547
Epoch 731/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3466
Epoch 732/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3483
Epoch 733/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3376
Epoch 734/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3519
Epoch 735/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3520
Epoch 736/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3650
Epoch 737/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3722
Epoch 738/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3423
Epoch 739/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3472
Epoch 740/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3422
Epoch 741/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3447
Epoch 742/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3786
Epoch 743/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3409
Epoch 744/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3318
Epoch 745/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3281
Epoch 746/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3304
Epoch 747/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3277
Epoch 748/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3441
Epoch 749/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3797
Epoch 750/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3511
Epoch 751/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3599
Epoch 752/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4169
Epoch 753/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4063
Epoch 754/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3516
Epoch 755/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3407
Epoch 756/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3493
Epoch 757/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3608
Epoch 758/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3780
Epoch 759/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3424
Epoch 760/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3436
Epoch 761/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3541
Epoch 762/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3457
Epoch 763/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3317
Epoch 764/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3496
Epoch 765/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3551
Epoch 766/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3396
Epoch 767/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3339
Epoch 768/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3589
Epoch 769/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3521
Epoch 770/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3301
Epoch 771/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3454
Epoch 772/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3471
Epoch 773/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3825
Epoch 774/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3659
Epoch 775/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3377
Epoch 776/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3882
Epoch 777/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3705
Epoch 778/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3279
Epoch 779/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3339
Epoch 780/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3435
Epoch 781/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3393
Epoch 782/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3259
Epoch 783/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3296
Epoch 784/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3298
Epoch 785/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3286
Epoch 786/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3392
Epoch 787/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3368
Epoch 788/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3307
Epoch 789/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3382
Epoch 790/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3355
Epoch 791/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3734
Epoch 792/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3761
Epoch 793/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3444
Epoch 794/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3632
Epoch 795/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3406
Epoch 796/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3788
Epoch 797/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3315
Epoch 798/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3506
Epoch 799/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3608
Epoch 800/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3491
Epoch 801/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3315
Epoch 802/1000
```

```
13/13 [==============================] - 0s 4ms/step - loss: 0.3287
Epoch 803/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3276
Epoch 804/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3280
Epoch 805/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3504
Epoch 806/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3500
Epoch 807/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3403
Epoch 808/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3552
Epoch 809/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3773
Epoch 810/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3458
Epoch 811/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3324
Epoch 812/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3241
Epoch 813/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3331
Epoch 814/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3376
Epoch 815/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3443
Epoch 816/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3452
Epoch 817/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3625
Epoch 818/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3543
Epoch 819/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3300
Epoch 820/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3694
Epoch 821/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3836
Epoch 822/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3472
Epoch 823/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3578
Epoch 824/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3510
Epoch 825/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3420
Epoch 826/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3308
Epoch 827/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3247
Epoch 828/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3456
Epoch 829/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3698
Epoch 830/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4228
Epoch 831/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3441
Epoch 832/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3515
Epoch 833/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3434
Epoch 834/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3518
Epoch 835/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3238
Epoch 836/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3339
Epoch 837/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3339
Epoch 838/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3434
Epoch 839/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3268
Epoch 840/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3740
Epoch 841/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3566
Epoch 842/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3545
Epoch 843/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3543
Epoch 844/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3347
Epoch 845/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3272
Epoch 846/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3351
Epoch 847/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3570
Epoch 848/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3441
Epoch 849/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3220
Epoch 850/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3376
Epoch 851/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3364
Epoch 852/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3501
Epoch 853/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3658
Epoch 854/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3400
Epoch 855/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3381
Epoch 856/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3374
Epoch 857/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3421
Epoch 858/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3686
Epoch 859/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3783
Epoch 860/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3459
Epoch 861/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3653
Epoch 862/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3272
Epoch 863/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3222
Epoch 864/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3736
Epoch 865/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3834
Epoch 866/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3725
Epoch 867/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3334
Epoch 868/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3360
Epoch 869/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3430
Epoch 870/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3601
Epoch 871/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3625
Epoch 872/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3410
Epoch 873/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3373
Epoch 874/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3479
Epoch 875/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3524
Epoch 876/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3360
Epoch 877/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3316
Epoch 878/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3564
Epoch 879/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3425
Epoch 880/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3270
Epoch 881/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3594
Epoch 882/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3598
Epoch 883/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4354
Epoch 884/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3778
Epoch 885/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3704
Epoch 886/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3419
Epoch 887/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3491
Epoch 888/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3509
Epoch 889/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3373
Epoch 890/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3713
Epoch 891/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3285
Epoch 892/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3294
Epoch 893/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3340
Epoch 894/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3266
Epoch 895/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3464
Epoch 896/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3392
Epoch 897/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3304
Epoch 898/1000
```

```
13/13 [==============================] - 0s 4ms/step - loss: 0.3448
Epoch 899/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3721
Epoch 900/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3583
Epoch 901/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3743
Epoch 902/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3616
Epoch 903/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3491
Epoch 904/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3283
Epoch 905/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3386
Epoch 906/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3571
Epoch 907/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3552
Epoch 908/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3694
Epoch 909/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4247
Epoch 910/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3797
Epoch 911/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3910
Epoch 912/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3706
Epoch 913/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3323
Epoch 914/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3561
Epoch 915/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3473
Epoch 916/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3535
Epoch 917/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3453
Epoch 918/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3378
Epoch 919/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3582
Epoch 920/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3751
Epoch 921/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3452
Epoch 922/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3507
Epoch 923/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3225
Epoch 924/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3479
Epoch 925/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3356
Epoch 926/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3285
Epoch 927/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3434
Epoch 928/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3272
Epoch 929/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3504
Epoch 930/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3919
Epoch 931/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4201
Epoch 932/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3934
Epoch 933/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3428
Epoch 934/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3645
Epoch 935/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3348
Epoch 936/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3342
Epoch 937/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3461
Epoch 938/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3503
Epoch 939/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3471
Epoch 940/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3407
Epoch 941/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3188
Epoch 942/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3240
Epoch 943/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3440
Epoch 944/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3599
Epoch 945/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3812
Epoch 946/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3393
Epoch 947/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3357
Epoch 948/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3297
Epoch 949/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3231
Epoch 950/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3178
Epoch 951/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3111
Epoch 952/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3343
Epoch 953/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3389
Epoch 954/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3572
Epoch 955/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3215
Epoch 956/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3439
Epoch 957/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3319
Epoch 958/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3322
Epoch 959/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3159
Epoch 960/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3218
Epoch 961/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3287
Epoch 962/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3196
Epoch 963/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3408
Epoch 964/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3208
Epoch 965/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3241
Epoch 966/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3396
Epoch 967/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3292
Epoch 968/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3362
Epoch 969/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3865
Epoch 970/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.3795
Epoch 971/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3494
Epoch 972/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3260
Epoch 973/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3279
Epoch 974/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3238
Epoch 975/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3419
Epoch 976/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3488
Epoch 977/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3278
Epoch 978/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3219
Epoch 979/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3267
Epoch 980/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3458
Epoch 981/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3263
Epoch 982/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3288
Epoch 983/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3174
Epoch 984/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3339
Epoch 985/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3361
Epoch 986/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3253
Epoch 987/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3248
Epoch 988/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3199
Epoch 989/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3323
Epoch 990/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3463
Epoch 991/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3422
Epoch 992/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3354
Epoch 993/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3225
Epoch 994/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3282
Epoch 995/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3532
Epoch 996/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3445
Epoch 997/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3738
Epoch 998/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3308
Epoch 999/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3505
Epoch 1000/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3514
```

[33]: `<keras.callbacks.History at 0x7f7740081810>`

[34]:
```python
# BEGIN UNIT TEST
model_r.summary()

model_r_test(model_r, classes, X_train.shape[1])
# END UNIT TEST
```

```
Model: "ComplexRegularized"

_____
 Layer (type)                Output Shape              Param #
=================================================================
 dense_5 (Dense)             (None, 120)               360

 dense_6 (Dense)             (None, 40)                4840

 dense_7 (Dense)             (None, 6)                 246

=================================================================
Total params: 5,446
Trainable params: 5,446
Non-trainable params: 0

_____
ddd
```
All tests passed!

Click for hints

Summary should match this (layer instance names may increment)

```
Model: "ComplexRegularized"

_____
 Layer (type)                Output Shape              Param #
=================================================================
 L1 (Dense)                  (None, 120)               360
```

```
----------------------------------------------------------------
L2 (Dense)                      (None, 40)              4840

----------------------------------------------------------------
L3 (Dense)                      (None, 6)               246
================================================================
Total params: 5,446
Trainable params: 5,446
Non-trainable params: 0

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

Click for more hints

```python
tf.random.set_seed(1234)
model_r = Sequential(
    [
        Dense(120, activation = 'relu', kernel_regularizer=tf.keras.regularizers.l2(0.1), name=
        Dense(40, activation = 'relu', kernel_regularizer=tf.keras.regularizers.l2(0.1), name="
        Dense(classes, activation = 'linear', name="L3")
    ], name="ComplexRegularized"
)
model_r.compile(
    loss=tf.keras.losses.SparseCategoricalCrossentropy(from_logits=True),
    optimizer=tf.keras.optimizers.Adam(0.01),
)

model_r.fit(
    X_train,y_train,
    epochs=1000
)
```

[35]:
```python
#make a model for plotting routines to call
model_predict_r = lambda Xl: np.argmax(tf.nn.softmax(model_r.predict(Xl)).
 ↪numpy(),axis=1)


plt_nn(model_predict_r, X_train,y_train, classes, X_cv, y_cv,
 ↪suptitle="Regularized")
```

Canvas(toolbar=Toolbar(toolitems=[('Home', 'Reset original view', 'home', 'home'), ('Back', 'Ba

The results look very similar to the 'ideal' model. Let's check classification error.

[36]:
```python
training_cerr_reg = eval_cat_err(y_train, model_predict_r(X_train))
cv_cerr_reg = eval_cat_err(y_cv, model_predict_r(X_cv))
test_cerr_reg = eval_cat_err(y_test, model_predict_r(X_test))
print(f"categorization error, training, regularized: {training_cerr_reg:0.3f},
 ↪simple model, {training_cerr_simple:0.3f}, complex model:
 ↪{training_cerr_complex:0.3f}" )
```

```python
print(f"categorization error, cv,       regularized: {cv_cerr_reg:0.3f}, simple
  ↪model, {cv_cerr_simple:0.3f}, complex model: {cv_cerr_complex:0.3f}" )
```

```
categorization error, training, regularized: 0.072, simple model, 0.062, complex
model: 0.003
categorization error, cv,       regularized: 0.066, simple model, 0.087, complex
model: 0.122
```

The simple model is a bit better in the training set than the regularized model but worse in the cross validation set.

7 - Iterate to find optimal regularization value As you did in linear regression, you can try many regularization values. This code takes several minutes to run. If you have time, you can run it and check the results. If not, you have completed the graded parts of the assignment!

```python
[37]: tf.random.set_seed(1234)
      lambdas = [0.0, 0.001, 0.01, 0.05, 0.1, 0.2, 0.3]
      models=[None] * len(lambdas)

      for i in range(len(lambdas)):
          lambda_ = lambdas[i]
          models[i] =  Sequential(
              [
                  Dense(120, activation = 'relu', kernel_regularizer=tf.keras.
      ↪regularizers.l2(lambda_)),
                  Dense(40, activation = 'relu', kernel_regularizer=tf.keras.
      ↪regularizers.l2(lambda_)),
                  Dense(classes, activation = 'linear')
              ]
          )
          models[i].compile(
              loss=tf.keras.losses.SparseCategoricalCrossentropy(from_logits=True),
              optimizer=tf.keras.optimizers.Adam(0.01),
          )

          models[i].fit(
              X_train,y_train,
              epochs=1000
          )
          print(f"Finished lambda = {lambda_}")
```

```
Epoch 1/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.1106
Epoch 2/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4281
Epoch 3/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3345
Epoch 4/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2896
Epoch 5/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2867
Epoch 6/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2918
Epoch 7/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2497
Epoch 8/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2298
Epoch 9/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2307
Epoch 10/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2071
Epoch 11/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2115
Epoch 12/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2070
Epoch 13/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2366
Epoch 14/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2261
Epoch 15/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2224
Epoch 16/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2055
Epoch 17/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2044
Epoch 18/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2006
Epoch 19/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2168
Epoch 20/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2047
Epoch 21/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2237
Epoch 22/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2497
Epoch 23/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2113
Epoch 24/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2025
Epoch 25/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2107
Epoch 26/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2000
Epoch 27/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1935
Epoch 28/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.1963
Epoch 29/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2188
Epoch 30/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2424
Epoch 31/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1969
Epoch 32/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1950
Epoch 33/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1904
Epoch 34/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2173
Epoch 35/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2074
Epoch 36/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1768
Epoch 37/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1794
Epoch 38/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1733
Epoch 39/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1955
Epoch 40/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1870
Epoch 41/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2128
Epoch 42/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1987
Epoch 43/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1895
Epoch 44/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2073
Epoch 45/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2148
Epoch 46/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1774
Epoch 47/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1886
Epoch 48/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1763
Epoch 49/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1769
Epoch 50/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1763
Epoch 51/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2020
Epoch 52/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.1889
Epoch 53/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2035
Epoch 54/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1761
Epoch 55/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1838
Epoch 56/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1774
Epoch 57/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1953
Epoch 58/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1882
Epoch 59/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1860
Epoch 60/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1919
Epoch 61/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1848
Epoch 62/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1630
Epoch 63/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1616
Epoch 64/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2008
Epoch 65/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1936
Epoch 66/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1824
Epoch 67/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2092
Epoch 68/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2287
Epoch 69/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1877
Epoch 70/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1716
Epoch 71/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1917
Epoch 72/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1703
Epoch 73/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1750
Epoch 74/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1836
Epoch 75/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1696
Epoch 76/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.1542
Epoch 77/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1715
Epoch 78/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1545
Epoch 79/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1593
Epoch 80/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1844
Epoch 81/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1881
Epoch 82/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1696
Epoch 83/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1614
Epoch 84/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1762
Epoch 85/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1779
Epoch 86/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1658
Epoch 87/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1614
Epoch 88/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1639
Epoch 89/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1629
Epoch 90/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1475
Epoch 91/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1452
Epoch 92/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1473
Epoch 93/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1490
Epoch 94/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1650
Epoch 95/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1706
Epoch 96/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1704
Epoch 97/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1764
Epoch 98/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1855
Epoch 99/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1685
Epoch 100/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.1569
Epoch 101/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1645
Epoch 102/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1737
Epoch 103/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1935
Epoch 104/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1600
Epoch 105/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1483
Epoch 106/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1555
Epoch 107/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1678
Epoch 108/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1435
Epoch 109/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1419
Epoch 110/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1494
Epoch 111/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1538
Epoch 112/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1682
Epoch 113/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1687
Epoch 114/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1436
Epoch 115/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1366
Epoch 116/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1485
Epoch 117/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1400
Epoch 118/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1357
Epoch 119/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1444
Epoch 120/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1403
Epoch 121/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1465
Epoch 122/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1549
Epoch 123/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1402
Epoch 124/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.1337
Epoch 125/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1422
Epoch 126/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1560
Epoch 127/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1319
Epoch 128/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1389
Epoch 129/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1404
Epoch 130/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1299
Epoch 131/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1247
Epoch 132/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1244
Epoch 133/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1260
Epoch 134/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1158
Epoch 135/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1343
Epoch 136/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1306
Epoch 137/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1294
Epoch 138/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1297
Epoch 139/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1342
Epoch 140/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1255
Epoch 141/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1232
Epoch 142/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1199
Epoch 143/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1192
Epoch 144/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1192
Epoch 145/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1342
Epoch 146/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1477
Epoch 147/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1780
Epoch 148/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.1673
Epoch 149/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1402
Epoch 150/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1292
Epoch 151/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1296
Epoch 152/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1221
Epoch 153/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1300
Epoch 154/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1316
Epoch 155/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1274
Epoch 156/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1192
Epoch 157/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1266
Epoch 158/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1185
Epoch 159/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1197
Epoch 160/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1148
Epoch 161/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1137
Epoch 162/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1427
Epoch 163/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1420
Epoch 164/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1327
Epoch 165/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1276
Epoch 166/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1099
Epoch 167/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1205
Epoch 168/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1307
Epoch 169/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1476
Epoch 170/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1673
Epoch 171/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1349
Epoch 172/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.1183
Epoch 173/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1225
Epoch 174/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1276
Epoch 175/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1029
Epoch 176/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1134
Epoch 177/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1081
Epoch 178/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1245
Epoch 179/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1346
Epoch 180/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1233
Epoch 181/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1113
Epoch 182/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1040
Epoch 183/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1155
Epoch 184/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1049
Epoch 185/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1111
Epoch 186/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1079
Epoch 187/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1021
Epoch 188/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1048
Epoch 189/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0971
Epoch 190/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0985
Epoch 191/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1026
Epoch 192/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1111
Epoch 193/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0991
Epoch 194/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0890
Epoch 195/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0880
Epoch 196/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.1006
Epoch 197/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0974
Epoch 198/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1141
Epoch 199/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1423
Epoch 200/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1381
Epoch 201/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1105
Epoch 202/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1005
Epoch 203/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0846
Epoch 204/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1125
Epoch 205/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1129
Epoch 206/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1219
Epoch 207/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1161
Epoch 208/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1137
Epoch 209/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1178
Epoch 210/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1017
Epoch 211/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1051
Epoch 212/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1014
Epoch 213/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1096
Epoch 214/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1087
Epoch 215/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1047
Epoch 216/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1044
Epoch 217/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1044
Epoch 218/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1006
Epoch 219/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1093
Epoch 220/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.1041
Epoch 221/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0956
Epoch 222/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1109
Epoch 223/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1041
Epoch 224/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1000
Epoch 225/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0968
Epoch 226/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0951
Epoch 227/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1092
Epoch 228/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1041
Epoch 229/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1032
Epoch 230/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1153
Epoch 231/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1237
Epoch 232/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0978
Epoch 233/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1074
Epoch 234/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1059
Epoch 235/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1122
Epoch 236/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0974
Epoch 237/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0879
Epoch 238/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0913
Epoch 239/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0831
Epoch 240/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0752
Epoch 241/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0733
Epoch 242/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0886
Epoch 243/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0837
Epoch 244/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0866
Epoch 245/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0933
Epoch 246/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0976
Epoch 247/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1150
Epoch 248/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0904
Epoch 249/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1073
Epoch 250/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1296
Epoch 251/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1022
Epoch 252/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0987
Epoch 253/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0846
Epoch 254/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0813
Epoch 255/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0924
Epoch 256/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0799
Epoch 257/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0947
Epoch 258/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0956
Epoch 259/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0788
Epoch 260/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1018
Epoch 261/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0942
Epoch 262/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0780
Epoch 263/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0821
Epoch 264/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0795
Epoch 265/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0924
Epoch 266/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0948
Epoch 267/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0767
Epoch 268/1000
```

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13/13 [==============================] - 0s 1ms/step - loss: 0.0720
Epoch 269/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0742
Epoch 270/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0747
Epoch 271/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0726
Epoch 272/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0984
Epoch 273/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1074
Epoch 274/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0836
Epoch 275/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0783
Epoch 276/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0799
Epoch 277/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1225
Epoch 278/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1017
Epoch 279/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0990
Epoch 280/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1014
Epoch 281/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0808
Epoch 282/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0798
Epoch 283/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0847
Epoch 284/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0755
Epoch 285/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0631
Epoch 286/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0651
Epoch 287/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0602
Epoch 288/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0733
Epoch 289/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0659
Epoch 290/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0682
Epoch 291/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0745
Epoch 292/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.0848
Epoch 293/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0701
Epoch 294/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0828
Epoch 295/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0741
Epoch 296/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0890
Epoch 297/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0800
Epoch 298/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0803
Epoch 299/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0765
Epoch 300/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0733
Epoch 301/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0544
Epoch 302/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0718
Epoch 303/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0877
Epoch 304/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0687
Epoch 305/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0671
Epoch 306/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0575
Epoch 307/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0773
Epoch 308/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0779
Epoch 309/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0696
Epoch 310/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0883
Epoch 311/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0880
Epoch 312/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0707
Epoch 313/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0603
Epoch 314/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0772
Epoch 315/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0660
Epoch 316/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0586
Epoch 317/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0618
Epoch 318/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0588
Epoch 319/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0674
Epoch 320/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0598
Epoch 321/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0670
Epoch 322/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0970
Epoch 323/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1366
Epoch 324/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1148
Epoch 325/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0837
Epoch 326/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0749
Epoch 327/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0746
Epoch 328/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0698
Epoch 329/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0691
Epoch 330/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0541
Epoch 331/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0558
Epoch 332/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0653
Epoch 333/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0593
Epoch 334/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0606
Epoch 335/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0696
Epoch 336/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0713
Epoch 337/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0628
Epoch 338/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0752
Epoch 339/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0723
Epoch 340/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0647
Epoch 341/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0688
Epoch 342/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0793
Epoch 343/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0595
Epoch 344/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0528
Epoch 345/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0552
Epoch 346/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0534
Epoch 347/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0471
Epoch 348/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0491
Epoch 349/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0524
Epoch 350/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0696
Epoch 351/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0690
Epoch 352/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0864
Epoch 353/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0999
Epoch 354/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1094
Epoch 355/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1189
Epoch 356/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1059
Epoch 357/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0655
Epoch 358/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0652
Epoch 359/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0544
Epoch 360/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0545
Epoch 361/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0549
Epoch 362/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0581
Epoch 363/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0506
Epoch 364/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.0579
Epoch 365/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0583
Epoch 366/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0607
Epoch 367/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0428
Epoch 368/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0495
Epoch 369/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0721
Epoch 370/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0817
Epoch 371/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0588
Epoch 372/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0516
Epoch 373/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0526
Epoch 374/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0463
Epoch 375/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0447
Epoch 376/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0441
Epoch 377/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0422
Epoch 378/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0391
Epoch 379/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0343
Epoch 380/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0461
Epoch 381/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0442
Epoch 382/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0496
Epoch 383/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0509
Epoch 384/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0479
Epoch 385/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0520
Epoch 386/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0391
Epoch 387/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0394
Epoch 388/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0510
Epoch 389/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0525
Epoch 390/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0666
Epoch 391/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0490
Epoch 392/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0551
Epoch 393/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0689
Epoch 394/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0663
Epoch 395/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0844
Epoch 396/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0704
Epoch 397/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0700
Epoch 398/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0591
Epoch 399/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0586
Epoch 400/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0628
Epoch 401/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1717
Epoch 402/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1648
Epoch 403/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1616
Epoch 404/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1326
Epoch 405/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1367
Epoch 406/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1098
Epoch 407/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1122
Epoch 408/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1798
Epoch 409/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1268
Epoch 410/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1123
Epoch 411/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0720
Epoch 412/1000
```

```
13/13 [==============================] - 0s 5ms/step - loss: 0.0774
Epoch 413/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0661
Epoch 414/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0720
Epoch 415/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0580
Epoch 416/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0572
Epoch 417/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0586
Epoch 418/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0546
Epoch 419/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0573
Epoch 420/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0721
Epoch 421/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0658
Epoch 422/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0686
Epoch 423/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0491
Epoch 424/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0647
Epoch 425/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0465
Epoch 426/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0435
Epoch 427/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0362
Epoch 428/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0411
Epoch 429/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0374
Epoch 430/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0412
Epoch 431/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0391
Epoch 432/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0412
Epoch 433/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0479
Epoch 434/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0436
Epoch 435/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0482
Epoch 436/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0420
Epoch 437/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0347
Epoch 438/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0390
Epoch 439/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0328
Epoch 440/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0371
Epoch 441/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0334
Epoch 442/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0348
Epoch 443/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0370
Epoch 444/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0408
Epoch 445/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0329
Epoch 446/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0318
Epoch 447/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0391
Epoch 448/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0408
Epoch 449/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0346
Epoch 450/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0340
Epoch 451/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0332
Epoch 452/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0325
Epoch 453/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0406
Epoch 454/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0394
Epoch 455/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0584
Epoch 456/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0440
Epoch 457/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0412
Epoch 458/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0468
Epoch 459/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0373
Epoch 460/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0329
Epoch 461/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0390
Epoch 462/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0284
Epoch 463/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0310
Epoch 464/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0348
Epoch 465/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0302
Epoch 466/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0348
Epoch 467/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0350
Epoch 468/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0347
Epoch 469/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0305
Epoch 470/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0369
Epoch 471/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0436
Epoch 472/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0543
Epoch 473/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0477
Epoch 474/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0630
Epoch 475/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1523
Epoch 476/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3248
Epoch 477/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1600
Epoch 478/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1623
Epoch 479/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1206
Epoch 480/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0955
Epoch 481/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1595
Epoch 482/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1626
Epoch 483/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1170
Epoch 484/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.1481
Epoch 485/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0686
Epoch 486/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0590
Epoch 487/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0651
Epoch 488/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0575
Epoch 489/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0593
Epoch 490/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0539
Epoch 491/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0451
Epoch 492/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0436
Epoch 493/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0484
Epoch 494/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0639
Epoch 495/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0497
Epoch 496/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0787
Epoch 497/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0805
Epoch 498/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0639
Epoch 499/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0504
Epoch 500/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0478
Epoch 501/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0466
Epoch 502/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0419
Epoch 503/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0365
Epoch 504/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0352
Epoch 505/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0368
Epoch 506/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0337
Epoch 507/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0375
Epoch 508/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.0317
Epoch 509/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0318
Epoch 510/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0364
Epoch 511/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0337
Epoch 512/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0290
Epoch 513/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0317
Epoch 514/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0320
Epoch 515/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0271
Epoch 516/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0343
Epoch 517/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0308
Epoch 518/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0388
Epoch 519/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0444
Epoch 520/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0381
Epoch 521/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0356
Epoch 522/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0324
Epoch 523/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0292
Epoch 524/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0308
Epoch 525/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0308
Epoch 526/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0365
Epoch 527/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0351
Epoch 528/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0305
Epoch 529/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0320
Epoch 530/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0351
Epoch 531/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0290
Epoch 532/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0329
Epoch 533/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0387
Epoch 534/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0431
Epoch 535/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0414
Epoch 536/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0318
Epoch 537/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0285
Epoch 538/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0278
Epoch 539/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0274
Epoch 540/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0338
Epoch 541/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0262
Epoch 542/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0283
Epoch 543/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0265
Epoch 544/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0267
Epoch 545/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0278
Epoch 546/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0256
Epoch 547/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0302
Epoch 548/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0323
Epoch 549/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0262
Epoch 550/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0288
Epoch 551/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0283
Epoch 552/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0315
Epoch 553/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0411
Epoch 554/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0376
Epoch 555/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0346
Epoch 556/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0296
Epoch 557/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0307
Epoch 558/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0270
Epoch 559/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0268
Epoch 560/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0303
Epoch 561/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0251
Epoch 562/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0267
Epoch 563/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0249
Epoch 564/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0265
Epoch 565/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0297
Epoch 566/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0338
Epoch 567/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0432
Epoch 568/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0483
Epoch 569/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1205
Epoch 570/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1063
Epoch 571/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1035
Epoch 572/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1415
Epoch 573/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1534
Epoch 574/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1474
Epoch 575/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0772
Epoch 576/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0691
Epoch 577/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0770
Epoch 578/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0637
Epoch 579/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0528
Epoch 580/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0371
Epoch 581/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0356
Epoch 582/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0431
Epoch 583/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0300
Epoch 584/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0309
Epoch 585/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0307
Epoch 586/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0321
Epoch 587/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0266
Epoch 588/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0274
Epoch 589/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0276
Epoch 590/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0267
Epoch 591/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0305
Epoch 592/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0278
Epoch 593/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0343
Epoch 594/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0259
Epoch 595/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0259
Epoch 596/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0258
Epoch 597/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0262
Epoch 598/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0254
Epoch 599/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0251
Epoch 600/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0241
Epoch 601/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0269
Epoch 602/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0287
Epoch 603/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0257
Epoch 604/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0254
Epoch 605/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0232
Epoch 606/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0281
Epoch 607/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0247
Epoch 608/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0254
Epoch 609/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0237
Epoch 610/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0253
Epoch 611/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0256
Epoch 612/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0235
Epoch 613/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0290
Epoch 614/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0236
Epoch 615/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0249
Epoch 616/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0253
Epoch 617/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0231
Epoch 618/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0241
Epoch 619/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0253
Epoch 620/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0290
Epoch 621/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0456
Epoch 622/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0647
Epoch 623/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1078
Epoch 624/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1180
Epoch 625/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0837
Epoch 626/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0510
Epoch 627/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0333
Epoch 628/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.0327
Epoch 629/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0389
Epoch 630/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0347
Epoch 631/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0342
Epoch 632/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0272
Epoch 633/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0240
Epoch 634/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0235
Epoch 635/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0243
Epoch 636/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0225
Epoch 637/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0222
Epoch 638/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0223
Epoch 639/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0215
Epoch 640/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0247
Epoch 641/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0248
Epoch 642/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0257
Epoch 643/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0213
Epoch 644/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0277
Epoch 645/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0266
Epoch 646/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0320
Epoch 647/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0269
Epoch 648/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0357
Epoch 649/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0321
Epoch 650/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0255
Epoch 651/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0287
Epoch 652/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0251
Epoch 653/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0242
Epoch 654/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0239
Epoch 655/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0218
Epoch 656/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0227
Epoch 657/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0247
Epoch 658/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0265
Epoch 659/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0257
Epoch 660/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0233
Epoch 661/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0246
Epoch 662/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0313
Epoch 663/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0238
Epoch 664/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0277
Epoch 665/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0205
Epoch 666/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0238
Epoch 667/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0249
Epoch 668/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0441
Epoch 669/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0441
Epoch 670/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0305
Epoch 671/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0323
Epoch 672/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0356
Epoch 673/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0670
Epoch 674/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1732
Epoch 675/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0889
Epoch 676/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.1098
Epoch 677/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0468
Epoch 678/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0532
Epoch 679/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0577
Epoch 680/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0880
Epoch 681/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1123
Epoch 682/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1581
Epoch 683/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1343
Epoch 684/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1065
Epoch 685/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1236
Epoch 686/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1184
Epoch 687/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1218
Epoch 688/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1673
Epoch 689/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1437
Epoch 690/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0897
Epoch 691/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0665
Epoch 692/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0579
Epoch 693/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0563
Epoch 694/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0425
Epoch 695/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0441
Epoch 696/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0411
Epoch 697/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0429
Epoch 698/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0347
Epoch 699/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0367
Epoch 700/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0311
Epoch 701/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0333
Epoch 702/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0308
Epoch 703/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0287
Epoch 704/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0297
Epoch 705/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0282
Epoch 706/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0263
Epoch 707/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0286
Epoch 708/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0275
Epoch 709/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0274
Epoch 710/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0252
Epoch 711/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0277
Epoch 712/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0261
Epoch 713/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0311
Epoch 714/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0265
Epoch 715/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0281
Epoch 716/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0275
Epoch 717/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0264
Epoch 718/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0240
Epoch 719/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0234
Epoch 720/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0284
Epoch 721/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0311
Epoch 722/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0244
Epoch 723/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0249
Epoch 724/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0269
Epoch 725/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0224
Epoch 726/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0238
Epoch 727/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0234
Epoch 728/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0223
Epoch 729/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0220
Epoch 730/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0268
Epoch 731/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0363
Epoch 732/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0300
Epoch 733/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0208
Epoch 734/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0254
Epoch 735/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0264
Epoch 736/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0230
Epoch 737/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0224
Epoch 738/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0270
Epoch 739/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0257
Epoch 740/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0228
Epoch 741/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0249
Epoch 742/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0241
Epoch 743/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0210
Epoch 744/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0216
Epoch 745/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0208
Epoch 746/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0227
Epoch 747/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0193
Epoch 748/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0241
Epoch 749/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0217
Epoch 750/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0248
Epoch 751/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0203
Epoch 752/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0194
Epoch 753/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0252
Epoch 754/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0203
Epoch 755/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0206
Epoch 756/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0192
Epoch 757/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0213
Epoch 758/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0206
Epoch 759/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0247
Epoch 760/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0227
Epoch 761/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0204
Epoch 762/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0219
Epoch 763/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0266
Epoch 764/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0699
Epoch 765/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0436
Epoch 766/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0451
Epoch 767/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1029
Epoch 768/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1082
Epoch 769/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0924
Epoch 770/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0936
Epoch 771/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0690
Epoch 772/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0589
Epoch 773/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0519
Epoch 774/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0714
Epoch 775/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1015
Epoch 776/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0932
Epoch 777/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1891
Epoch 778/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1356
Epoch 779/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1081
Epoch 780/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0973
Epoch 781/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0768
Epoch 782/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0761
Epoch 783/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1075
Epoch 784/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0789
Epoch 785/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0467
Epoch 786/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0394
Epoch 787/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0360
Epoch 788/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0324
Epoch 789/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0329
Epoch 790/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0291
Epoch 791/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0283
Epoch 792/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0291
Epoch 793/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0261
Epoch 794/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0294
Epoch 795/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0250
Epoch 796/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0292
Epoch 797/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0286
Epoch 798/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0271
Epoch 799/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0307
Epoch 800/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0298
Epoch 801/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0371
Epoch 802/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0259
Epoch 803/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0274
Epoch 804/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0266
Epoch 805/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0260
Epoch 806/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0254
Epoch 807/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0258
Epoch 808/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0252
Epoch 809/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0280
Epoch 810/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0249
Epoch 811/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0255
Epoch 812/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0259
Epoch 813/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0310
Epoch 814/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0258
Epoch 815/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0246
Epoch 816/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0263
Epoch 817/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0328
Epoch 818/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0247
Epoch 819/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0250
Epoch 820/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0258
Epoch 821/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0252
Epoch 822/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0256
Epoch 823/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0299
Epoch 824/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0312
Epoch 825/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0243
Epoch 826/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0263
Epoch 827/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0247
Epoch 828/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0233
Epoch 829/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0246
Epoch 830/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0262
Epoch 831/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0259
Epoch 832/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0238
Epoch 833/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0221
Epoch 834/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0240
Epoch 835/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0248
Epoch 836/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0253
Epoch 837/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0340
Epoch 838/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0229
Epoch 839/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0294
Epoch 840/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0286
Epoch 841/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0268
Epoch 842/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0283
Epoch 843/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0271
Epoch 844/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0247
Epoch 845/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0235
Epoch 846/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0300
Epoch 847/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0246
Epoch 848/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0244
Epoch 849/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0219
Epoch 850/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0258
Epoch 851/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0244
Epoch 852/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0257
Epoch 853/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0220
Epoch 854/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0221
Epoch 855/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0256
Epoch 856/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0211
Epoch 857/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0227
Epoch 858/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0252
Epoch 859/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0224
Epoch 860/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0214
Epoch 861/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0204
Epoch 862/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0228
Epoch 863/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0206
Epoch 864/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0198
Epoch 865/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0200
Epoch 866/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0273
Epoch 867/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0271
Epoch 868/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.0217
Epoch 869/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0231
Epoch 870/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0325
Epoch 871/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0354
Epoch 872/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0321
Epoch 873/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0216
Epoch 874/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0201
Epoch 875/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0218
Epoch 876/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0217
Epoch 877/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0275
Epoch 878/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0305
Epoch 879/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0440
Epoch 880/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0466
Epoch 881/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0729
Epoch 882/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0460
Epoch 883/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0439
Epoch 884/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0811
Epoch 885/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0291
Epoch 886/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0309
Epoch 887/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0289
Epoch 888/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0294
Epoch 889/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0283
Epoch 890/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0240
Epoch 891/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0232
Epoch 892/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0225
Epoch 893/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0196
Epoch 894/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0218
Epoch 895/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0189
Epoch 896/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0221
Epoch 897/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0204
Epoch 898/1000
13/13 [==============================] - 0s 5ms/step - loss: 0.0200
Epoch 899/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0208
Epoch 900/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0205
Epoch 901/1000
13/13 [==============================] - 0s 5ms/step - loss: 0.0199
Epoch 902/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0298
Epoch 903/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0185
Epoch 904/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0290
Epoch 905/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0272
Epoch 906/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0237
Epoch 907/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0190
Epoch 908/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0210
Epoch 909/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0189
Epoch 910/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0199
Epoch 911/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0688
Epoch 912/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1337
Epoch 913/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1883
Epoch 914/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2096
Epoch 915/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1323
Epoch 916/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0795
Epoch 917/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1167
Epoch 918/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0621
Epoch 919/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0929
Epoch 920/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0352
Epoch 921/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0303
Epoch 922/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0287
Epoch 923/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0457
Epoch 924/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0712
Epoch 925/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0553
Epoch 926/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0385
Epoch 927/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0311
Epoch 928/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.0394
Epoch 929/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0261
Epoch 930/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0346
Epoch 931/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0332
Epoch 932/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0322
Epoch 933/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0311
Epoch 934/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0493
Epoch 935/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0289
Epoch 936/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0325
Epoch 937/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0255
Epoch 938/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0210
Epoch 939/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0235
Epoch 940/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0259
Epoch 941/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0371
Epoch 942/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0300
Epoch 943/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0265
Epoch 944/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0327
Epoch 945/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0367
Epoch 946/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0307
Epoch 947/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0376
Epoch 948/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0375
Epoch 949/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0350
Epoch 950/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0284
Epoch 951/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0293
Epoch 952/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0374
Epoch 953/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0353
Epoch 954/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0395
Epoch 955/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0405
Epoch 956/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0432
Epoch 957/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0234
Epoch 958/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0266
Epoch 959/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0213
Epoch 960/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0200
Epoch 961/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0203
Epoch 962/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0190
Epoch 963/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0239
Epoch 964/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.0240
Epoch 965/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.0261
Epoch 966/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0197
Epoch 967/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0206
Epoch 968/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0188
Epoch 969/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0200
Epoch 970/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0169
Epoch 971/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0161
Epoch 972/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0176
Epoch 973/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0218
Epoch 974/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0161
Epoch 975/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0203
Epoch 976/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0384
Epoch 977/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0292
Epoch 978/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0234
Epoch 979/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0522
Epoch 980/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0851
Epoch 981/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0541
Epoch 982/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0380
Epoch 983/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0328
Epoch 984/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0276
Epoch 985/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0227
Epoch 986/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0235
Epoch 987/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0287
Epoch 988/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.0170
Epoch 989/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0166
Epoch 990/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0175
Epoch 991/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0149
Epoch 992/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0152
Epoch 993/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0153
Epoch 994/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0142
Epoch 995/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0199
Epoch 996/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0231
Epoch 997/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.0199
Epoch 998/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0188
Epoch 999/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0155
Epoch 1000/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.0172
Finished lambda = 0.0
Epoch 1/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.1055
Epoch 2/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4858
Epoch 3/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4067
Epoch 4/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3608
Epoch 5/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3565
Epoch 6/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3595
Epoch 7/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3211
Epoch 8/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3000
Epoch 9/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2910
Epoch 10/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2648
Epoch 11/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2734
```

```
Epoch 12/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2646
Epoch 13/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2929
Epoch 14/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2762
Epoch 15/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3013
Epoch 16/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2616
Epoch 17/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2628
Epoch 18/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2574
Epoch 19/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2740
Epoch 20/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2536
Epoch 21/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2622
Epoch 22/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2747
Epoch 23/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2742
Epoch 24/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2539
Epoch 25/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2712
Epoch 26/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2506
Epoch 27/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2506
Epoch 28/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2504
Epoch 29/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2647
Epoch 30/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2773
Epoch 31/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2587
Epoch 32/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2579
Epoch 33/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2446
Epoch 34/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2647
Epoch 35/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2664
```

```
Epoch 36/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2432
Epoch 37/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2508
Epoch 38/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2304
Epoch 39/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2398
Epoch 40/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2355
Epoch 41/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2703
Epoch 42/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2665
Epoch 43/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2429
Epoch 44/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2581
Epoch 45/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2825
Epoch 46/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2437
Epoch 47/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2321
Epoch 48/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2325
Epoch 49/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2283
Epoch 50/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2255
Epoch 51/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2451
Epoch 52/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2366
Epoch 53/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2477
Epoch 54/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2280
Epoch 55/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2741
Epoch 56/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2435
Epoch 57/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2698
Epoch 58/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2489
Epoch 59/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2588
```

```
Epoch 60/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2569
Epoch 61/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2475
Epoch 62/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2257
Epoch 63/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2267
Epoch 64/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2697
Epoch 65/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2643
Epoch 66/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2571
Epoch 67/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2815
Epoch 68/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2878
Epoch 69/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2394
Epoch 70/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2338
Epoch 71/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2546
Epoch 72/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2465
Epoch 73/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2550
Epoch 74/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2502
Epoch 75/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2468
Epoch 76/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2304
Epoch 77/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2368
Epoch 78/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2341
Epoch 79/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2314
Epoch 80/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2368
Epoch 81/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2401
Epoch 82/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2478
Epoch 83/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2346
```

```
Epoch 84/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2324
Epoch 85/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2536
Epoch 86/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2255
Epoch 87/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2297
Epoch 88/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2306
Epoch 89/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2300
Epoch 90/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2262
Epoch 91/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2189
Epoch 92/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2184
Epoch 93/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2201
Epoch 94/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2176
Epoch 95/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2427
Epoch 96/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2451
Epoch 97/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2428
Epoch 98/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2501
Epoch 99/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2412
Epoch 100/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2254
Epoch 101/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2411
Epoch 102/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2359
Epoch 103/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2533
Epoch 104/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2353
Epoch 105/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2218
Epoch 106/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2232
Epoch 107/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2330
```

```
Epoch 108/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2145
Epoch 109/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2194
Epoch 110/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2264
Epoch 111/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2220
Epoch 112/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2372
Epoch 113/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2271
Epoch 114/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2141
Epoch 115/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2125
Epoch 116/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2254
Epoch 117/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2180
Epoch 118/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2147
Epoch 119/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2193
Epoch 120/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2160
Epoch 121/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2220
Epoch 122/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2230
Epoch 123/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2187
Epoch 124/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2099
Epoch 125/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2094
Epoch 126/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2328
Epoch 127/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2216
Epoch 128/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2138
Epoch 129/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2163
Epoch 130/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2168
Epoch 131/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2217
```

```
Epoch 132/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2144
Epoch 133/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2035
Epoch 134/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2080
Epoch 135/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2124
Epoch 136/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2100
Epoch 137/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2188
Epoch 138/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2184
Epoch 139/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2081
Epoch 140/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2205
Epoch 141/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2095
Epoch 142/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2068
Epoch 143/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2077
Epoch 144/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2204
Epoch 145/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2201
Epoch 146/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2146
Epoch 147/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2133
Epoch 148/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2092
Epoch 149/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2115
Epoch 150/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2234
Epoch 151/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2182
Epoch 152/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2191
Epoch 153/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2164
Epoch 154/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2110
Epoch 155/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2173
```

```
Epoch 156/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2131
Epoch 157/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2189
Epoch 158/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2196
Epoch 159/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2014
Epoch 160/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2044
Epoch 161/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2024
Epoch 162/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2071
Epoch 163/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2171
Epoch 164/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2202
Epoch 165/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2135
Epoch 166/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2072
Epoch 167/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2135
Epoch 168/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2180
Epoch 169/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2160
Epoch 170/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2288
Epoch 171/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2118
Epoch 172/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2039
Epoch 173/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2185
Epoch 174/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2109
Epoch 175/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1978
Epoch 176/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2058
Epoch 177/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2035
Epoch 178/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2134
Epoch 179/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2120
```

```
Epoch 180/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2032
Epoch 181/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2208
Epoch 182/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2110
Epoch 183/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2122
Epoch 184/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2098
Epoch 185/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2084
Epoch 186/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1989
Epoch 187/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2045
Epoch 188/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2013
Epoch 189/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2033
Epoch 190/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2129
Epoch 191/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2110
Epoch 192/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2040
Epoch 193/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2081
Epoch 194/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2046
Epoch 195/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1934
Epoch 196/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1943
Epoch 197/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2082
Epoch 198/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2047
Epoch 199/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2199
Epoch 200/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2055
Epoch 201/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1974
Epoch 202/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1992
Epoch 203/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1944
```

```
Epoch 204/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2274
Epoch 205/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1976
Epoch 206/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1989
Epoch 207/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2099
Epoch 208/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2115
Epoch 209/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1963
Epoch 210/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2017
Epoch 211/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2062
Epoch 212/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2089
Epoch 213/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2148
Epoch 214/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2068
Epoch 215/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2078
Epoch 216/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2014
Epoch 217/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2152
Epoch 218/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2124
Epoch 219/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2030
Epoch 220/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2046
Epoch 221/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1955
Epoch 222/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1952
Epoch 223/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2066
Epoch 224/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2206
Epoch 225/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2010
Epoch 226/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1978
Epoch 227/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1886
```

```
Epoch 228/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1925
Epoch 229/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1953
Epoch 230/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2075
Epoch 231/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2373
Epoch 232/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2167
Epoch 233/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2053
Epoch 234/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1968
Epoch 235/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2008
Epoch 236/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1953
Epoch 237/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1950
Epoch 238/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2228
Epoch 239/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2118
Epoch 240/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2069
Epoch 241/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2012
Epoch 242/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2153
Epoch 243/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2126
Epoch 244/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2101
Epoch 245/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1979
Epoch 246/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1987
Epoch 247/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1946
Epoch 248/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1889
Epoch 249/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1984
Epoch 250/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1975
Epoch 251/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1919
```

```
Epoch 252/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1904
Epoch 253/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1942
Epoch 254/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2016
Epoch 255/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1996
Epoch 256/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1887
Epoch 257/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2110
Epoch 258/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2040
Epoch 259/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1890
Epoch 260/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1960
Epoch 261/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2038
Epoch 262/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1948
Epoch 263/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1931
Epoch 264/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1913
Epoch 265/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1912
Epoch 266/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1895
Epoch 267/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1990
Epoch 268/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1895
Epoch 269/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1909
Epoch 270/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1946
Epoch 271/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1935
Epoch 272/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1962
Epoch 273/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2024
Epoch 274/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1985
Epoch 275/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2075
```

```
Epoch 276/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1942
Epoch 277/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1964
Epoch 278/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1922
Epoch 279/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2000
Epoch 280/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1983
Epoch 281/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1969
Epoch 282/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1901
Epoch 283/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1988
Epoch 284/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1857
Epoch 285/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1860
Epoch 286/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1946
Epoch 287/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1907
Epoch 288/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2126
Epoch 289/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2023
Epoch 290/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1985
Epoch 291/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1901
Epoch 292/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1820
Epoch 293/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1869
Epoch 294/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1866
Epoch 295/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1950
Epoch 296/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1952
Epoch 297/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1884
Epoch 298/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2042
Epoch 299/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1900
```

```
Epoch 300/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1985
Epoch 301/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2013
Epoch 302/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2040
Epoch 303/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2127
Epoch 304/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1954
Epoch 305/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1994
Epoch 306/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1881
Epoch 307/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1973
Epoch 308/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1940
Epoch 309/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1895
Epoch 310/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1879
Epoch 311/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1832
Epoch 312/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1879
Epoch 313/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1920
Epoch 314/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1844
Epoch 315/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1927
Epoch 316/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1871
Epoch 317/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1866
Epoch 318/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2143
Epoch 319/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1956
Epoch 320/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1846
Epoch 321/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1823
Epoch 322/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1892
Epoch 323/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2019
```

```
Epoch 324/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1810
Epoch 325/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1885
Epoch 326/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1797
Epoch 327/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1900
Epoch 328/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1975
Epoch 329/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1947
Epoch 330/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1871
Epoch 331/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1923
Epoch 332/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1922
Epoch 333/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1962
Epoch 334/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2092
Epoch 335/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2044
Epoch 336/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1936
Epoch 337/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1886
Epoch 338/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1911
Epoch 339/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1960
Epoch 340/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1932
Epoch 341/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1838
Epoch 342/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1832
Epoch 343/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1799
Epoch 344/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1793
Epoch 345/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1950
Epoch 346/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1947
Epoch 347/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1916
```

```
Epoch 348/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1930
Epoch 349/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1804
Epoch 350/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1765
Epoch 351/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1839
Epoch 352/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1919
Epoch 353/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1982
Epoch 354/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1934
Epoch 355/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1957
Epoch 356/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1822
Epoch 357/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1815
Epoch 358/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1859
Epoch 359/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1802
Epoch 360/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1887
Epoch 361/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1839
Epoch 362/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2091
Epoch 363/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1962
Epoch 364/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1910
Epoch 365/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1972
Epoch 366/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1994
Epoch 367/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1840
Epoch 368/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1756
Epoch 369/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1775
Epoch 370/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1890
Epoch 371/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1755
```

```
Epoch 372/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1778
Epoch 373/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1861
Epoch 374/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1799
Epoch 375/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1866
Epoch 376/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1800
Epoch 377/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1793
Epoch 378/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1850
Epoch 379/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1849
Epoch 380/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1833
Epoch 381/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1820
Epoch 382/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1913
Epoch 383/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2015
Epoch 384/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1958
Epoch 385/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1810
Epoch 386/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1816
Epoch 387/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1793
Epoch 388/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1775
Epoch 389/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1880
Epoch 390/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1937
Epoch 391/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1957
Epoch 392/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1833
Epoch 393/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1794
Epoch 394/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1742
Epoch 395/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1827
```

```
Epoch 396/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1841
Epoch 397/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1877
Epoch 398/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1852
Epoch 399/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1804
Epoch 400/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1793
Epoch 401/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1811
Epoch 402/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1814
Epoch 403/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1797
Epoch 404/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1781
Epoch 405/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1703
Epoch 406/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1769
Epoch 407/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1819
Epoch 408/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1797
Epoch 409/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1801
Epoch 410/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1771
Epoch 411/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1905
Epoch 412/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1850
Epoch 413/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1878
Epoch 414/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1764
Epoch 415/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1702
Epoch 416/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1813
Epoch 417/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1852
Epoch 418/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1756
Epoch 419/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1730
```

```
Epoch 420/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1734
Epoch 421/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1806
Epoch 422/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1750
Epoch 423/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1810
Epoch 424/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1855
Epoch 425/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1778
Epoch 426/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1800
Epoch 427/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1719
Epoch 428/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1764
Epoch 429/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1678
Epoch 430/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1733
Epoch 431/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1739
Epoch 432/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1725
Epoch 433/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1822
Epoch 434/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1725
Epoch 435/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1819
Epoch 436/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1952
Epoch 437/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1776
Epoch 438/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1788
Epoch 439/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1701
Epoch 440/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1785
Epoch 441/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1721
Epoch 442/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1750
Epoch 443/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1800
```

```
Epoch 444/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1697
Epoch 445/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1742
Epoch 446/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1905
Epoch 447/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1883
Epoch 448/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1722
Epoch 449/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1719
Epoch 450/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1731
Epoch 451/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1819
Epoch 452/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1721
Epoch 453/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1752
Epoch 454/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1742
Epoch 455/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1744
Epoch 456/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1711
Epoch 457/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1748
Epoch 458/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1788
Epoch 459/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1799
Epoch 460/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1711
Epoch 461/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1777
Epoch 462/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1691
Epoch 463/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1777
Epoch 464/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1802
Epoch 465/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1750
Epoch 466/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1755
Epoch 467/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1792
```

```
Epoch 468/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1744
Epoch 469/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1654
Epoch 470/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1720
Epoch 471/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1833
Epoch 472/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1737
Epoch 473/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1689
Epoch 474/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1731
Epoch 475/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1811
Epoch 476/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1756
Epoch 477/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1820
Epoch 478/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1972
Epoch 479/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1826
Epoch 480/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1786
Epoch 481/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1727
Epoch 482/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1761
Epoch 483/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1784
Epoch 484/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1865
Epoch 485/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1801
Epoch 486/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1695
Epoch 487/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1741
Epoch 488/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1731
Epoch 489/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1732
Epoch 490/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1808
Epoch 491/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1713
```

```
Epoch 492/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1770
Epoch 493/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1698
Epoch 494/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1808
Epoch 495/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1732
Epoch 496/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1892
Epoch 497/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1761
Epoch 498/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1763
Epoch 499/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1737
Epoch 500/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1731
Epoch 501/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1714
Epoch 502/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1789
Epoch 503/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1904
Epoch 504/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1732
Epoch 505/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1770
Epoch 506/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1708
Epoch 507/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1765
Epoch 508/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1627
Epoch 509/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1732
Epoch 510/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1714
Epoch 511/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1680
Epoch 512/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1712
Epoch 513/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1709
Epoch 514/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1726
Epoch 515/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1670
```

```
Epoch 516/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1681
Epoch 517/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1617
Epoch 518/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1680
Epoch 519/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1839
Epoch 520/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1735
Epoch 521/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1882
Epoch 522/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1784
Epoch 523/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1759
Epoch 524/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1657
Epoch 525/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1669
Epoch 526/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1650
Epoch 527/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1754
Epoch 528/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1749
Epoch 529/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1827
Epoch 530/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1671
Epoch 531/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1650
Epoch 532/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1651
Epoch 533/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1686
Epoch 534/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1726
Epoch 535/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1681
Epoch 536/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1750
Epoch 537/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1724
Epoch 538/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1626
Epoch 539/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1664
```

```
Epoch 540/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1730
Epoch 541/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1869
Epoch 542/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1679
Epoch 543/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1635
Epoch 544/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1683
Epoch 545/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1704
Epoch 546/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1692
Epoch 547/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1742
Epoch 548/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1743
Epoch 549/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1815
Epoch 550/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1871
Epoch 551/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1805
Epoch 552/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1800
Epoch 553/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1729
Epoch 554/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1697
Epoch 555/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1675
Epoch 556/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1669
Epoch 557/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1669
Epoch 558/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1689
Epoch 559/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1717
Epoch 560/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1732
Epoch 561/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1760
Epoch 562/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1676
Epoch 563/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1701
```

```
Epoch 564/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1608
Epoch 565/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1627
Epoch 566/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1692
Epoch 567/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1792
Epoch 568/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1907
Epoch 569/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1717
Epoch 570/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1712
Epoch 571/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1690
Epoch 572/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1726
Epoch 573/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1668
Epoch 574/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1646
Epoch 575/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1633
Epoch 576/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1623
Epoch 577/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1674
Epoch 578/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1770
Epoch 579/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1626
Epoch 580/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1734
Epoch 581/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1641
Epoch 582/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1642
Epoch 583/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1660
Epoch 584/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1715
Epoch 585/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1646
Epoch 586/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1651
Epoch 587/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1687
```

```
Epoch 588/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1636
Epoch 589/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1671
Epoch 590/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1664
Epoch 591/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1848
Epoch 592/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1959
Epoch 593/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1758
Epoch 594/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1660
Epoch 595/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1688
Epoch 596/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1687
Epoch 597/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1634
Epoch 598/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1754
Epoch 599/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1679
Epoch 600/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1763
Epoch 601/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1678
Epoch 602/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1666
Epoch 603/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1664
Epoch 604/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1667
Epoch 605/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1640
Epoch 606/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1624
Epoch 607/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1660
Epoch 608/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1686
Epoch 609/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1678
Epoch 610/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1728
Epoch 611/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1634
```

```
Epoch 612/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1657
Epoch 613/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1728
Epoch 614/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1716
Epoch 615/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1674
Epoch 616/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1601
Epoch 617/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1609
Epoch 618/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1690
Epoch 619/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1643
Epoch 620/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1705
Epoch 621/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1785
Epoch 622/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1632
Epoch 623/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1720
Epoch 624/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1634
Epoch 625/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1655
Epoch 626/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1685
Epoch 627/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1638
Epoch 628/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1630
Epoch 629/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1606
Epoch 630/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1633
Epoch 631/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1651
Epoch 632/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1616
Epoch 633/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1572
Epoch 634/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1576
Epoch 635/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1616
```

```
Epoch 636/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1724
Epoch 637/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1782
Epoch 638/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1818
Epoch 639/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1664
Epoch 640/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1669
Epoch 641/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1659
Epoch 642/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1644
Epoch 643/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1588
Epoch 644/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1608
Epoch 645/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1689
Epoch 646/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1672
Epoch 647/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1631
Epoch 648/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1641
Epoch 649/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1597
Epoch 650/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1691
Epoch 651/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1637
Epoch 652/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1590
Epoch 653/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1591
Epoch 654/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1654
Epoch 655/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1628
Epoch 656/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1575
Epoch 657/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1627
Epoch 658/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1637
Epoch 659/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1640
```

```
Epoch 660/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1630
Epoch 661/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1638
Epoch 662/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1606
Epoch 663/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1622
Epoch 664/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1666
Epoch 665/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1570
Epoch 666/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1608
Epoch 667/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1652
Epoch 668/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1617
Epoch 669/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1643
Epoch 670/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1612
Epoch 671/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1640
Epoch 672/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1693
Epoch 673/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1591
Epoch 674/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1650
Epoch 675/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1610
Epoch 676/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1566
Epoch 677/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1623
Epoch 678/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1564
Epoch 679/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1675
Epoch 680/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1742
Epoch 681/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1790
Epoch 682/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1779
Epoch 683/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1753
```

```
Epoch 684/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1692
Epoch 685/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1788
Epoch 686/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1874
Epoch 687/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1708
Epoch 688/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1683
Epoch 689/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1634
Epoch 690/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1617
Epoch 691/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1640
Epoch 692/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1608
Epoch 693/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1657
Epoch 694/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1631
Epoch 695/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1630
Epoch 696/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1552
Epoch 697/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1622
Epoch 698/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1611
Epoch 699/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1574
Epoch 700/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1555
Epoch 701/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1579
Epoch 702/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1627
Epoch 703/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1560
Epoch 704/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1624
Epoch 705/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1583
Epoch 706/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1563
Epoch 707/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1612
```

```
Epoch 708/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1604
Epoch 709/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1750
Epoch 710/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1753
Epoch 711/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1708
Epoch 712/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1668
Epoch 713/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1671
Epoch 714/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1543
Epoch 715/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1748
Epoch 716/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1604
Epoch 717/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1651
Epoch 718/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1606
Epoch 719/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1602
Epoch 720/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1585
Epoch 721/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1671
Epoch 722/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1553
Epoch 723/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1588
Epoch 724/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1534
Epoch 725/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1654
Epoch 726/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1566
Epoch 727/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1590
Epoch 728/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1607
Epoch 729/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1564
Epoch 730/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1612
Epoch 731/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1658
```

```
Epoch 732/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1772
Epoch 733/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1629
Epoch 734/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1657
Epoch 735/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1574
Epoch 736/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1603
Epoch 737/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1598
Epoch 738/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1714
Epoch 739/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1832
Epoch 740/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1698
Epoch 741/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1638
Epoch 742/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1561
Epoch 743/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1575
Epoch 744/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1536
Epoch 745/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1615
Epoch 746/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1653
Epoch 747/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1647
Epoch 748/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1587
Epoch 749/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1592
Epoch 750/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1620
Epoch 751/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1577
Epoch 752/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1612
Epoch 753/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1570
Epoch 754/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1626
Epoch 755/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1578
```

```
Epoch 756/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1551
Epoch 757/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1586
Epoch 758/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1532
Epoch 759/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1573
Epoch 760/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1603
Epoch 761/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1582
Epoch 762/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1551
Epoch 763/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1670
Epoch 764/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1811
Epoch 765/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1565
Epoch 766/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1609
Epoch 767/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1624
Epoch 768/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1588
Epoch 769/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1516
Epoch 770/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1537
Epoch 771/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1596
Epoch 772/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1531
Epoch 773/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1655
Epoch 774/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1720
Epoch 775/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1744
Epoch 776/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1563
Epoch 777/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1590
Epoch 778/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1543
Epoch 779/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1536
```

```
Epoch 780/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1526
Epoch 781/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1564
Epoch 782/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1557
Epoch 783/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1491
Epoch 784/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1597
Epoch 785/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1565
Epoch 786/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1683
Epoch 787/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1617
Epoch 788/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1532
Epoch 789/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1497
Epoch 790/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1545
Epoch 791/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1577
Epoch 792/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1562
Epoch 793/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1554
Epoch 794/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1573
Epoch 795/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1554
Epoch 796/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1542
Epoch 797/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1676
Epoch 798/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1574
Epoch 799/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1515
Epoch 800/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1504
Epoch 801/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1536
Epoch 802/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1482
Epoch 803/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1533
```

```
Epoch 804/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1660
Epoch 805/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1520
Epoch 806/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1538
Epoch 807/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1547
Epoch 808/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1503
Epoch 809/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1535
Epoch 810/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1703
Epoch 811/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1708
Epoch 812/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1572
Epoch 813/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1517
Epoch 814/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1531
Epoch 815/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1550
Epoch 816/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1579
Epoch 817/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1608
Epoch 818/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1555
Epoch 819/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1793
Epoch 820/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1690
Epoch 821/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1628
Epoch 822/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1627
Epoch 823/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1586
Epoch 824/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1757
Epoch 825/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1684
Epoch 826/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1590
Epoch 827/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1590
```

```
Epoch 828/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1637
Epoch 829/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1608
Epoch 830/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1513
Epoch 831/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1630
Epoch 832/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1555
Epoch 833/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1585
Epoch 834/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1480
Epoch 835/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1504
Epoch 836/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1528
Epoch 837/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1586
Epoch 838/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1555
Epoch 839/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1596
Epoch 840/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1552
Epoch 841/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1612
Epoch 842/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1690
Epoch 843/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1602
Epoch 844/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1541
Epoch 845/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1550
Epoch 846/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1606
Epoch 847/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1592
Epoch 848/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1574
Epoch 849/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1516
Epoch 850/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1509
Epoch 851/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1519
```

```
Epoch 852/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1667
Epoch 853/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1508
Epoch 854/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1507
Epoch 855/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1633
Epoch 856/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1582
Epoch 857/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1661
Epoch 858/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1703
Epoch 859/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1607
Epoch 860/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1603
Epoch 861/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1549
Epoch 862/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1584
Epoch 863/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1518
Epoch 864/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1543
Epoch 865/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1512
Epoch 866/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1637
Epoch 867/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1567
Epoch 868/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1579
Epoch 869/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1508
Epoch 870/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1573
Epoch 871/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1512
Epoch 872/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1483
Epoch 873/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1507
Epoch 874/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1528
Epoch 875/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1563
```

```
Epoch 876/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1574
Epoch 877/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1532
Epoch 878/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1611
Epoch 879/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1620
Epoch 880/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1547
Epoch 881/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1618
Epoch 882/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1671
Epoch 883/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1656
Epoch 884/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1590
Epoch 885/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1662
Epoch 886/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1552
Epoch 887/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1557
Epoch 888/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1586
Epoch 889/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1580
Epoch 890/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1534
Epoch 891/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1542
Epoch 892/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1603
Epoch 893/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1542
Epoch 894/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1605
Epoch 895/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1594
Epoch 896/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1528
Epoch 897/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1592
Epoch 898/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1519
Epoch 899/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1682
```

```
Epoch 900/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1645
Epoch 901/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1666
Epoch 902/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1746
Epoch 903/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1785
Epoch 904/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1790
Epoch 905/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1830
Epoch 906/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1629
Epoch 907/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1628
Epoch 908/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1514
Epoch 909/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1558
Epoch 910/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1518
Epoch 911/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1519
Epoch 912/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1464
Epoch 913/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1500
Epoch 914/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1474
Epoch 915/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1558
Epoch 916/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1530
Epoch 917/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1539
Epoch 918/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1493
Epoch 919/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1500
Epoch 920/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1471
Epoch 921/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1483
Epoch 922/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1545
Epoch 923/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1526
```

```
Epoch 924/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1526
Epoch 925/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1487
Epoch 926/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1503
Epoch 927/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1488
Epoch 928/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1499
Epoch 929/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1495
Epoch 930/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1526
Epoch 931/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1513
Epoch 932/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1522
Epoch 933/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1556
Epoch 934/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1561
Epoch 935/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1499
Epoch 936/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1436
Epoch 937/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1455
Epoch 938/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1599
Epoch 939/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1516
Epoch 940/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1553
Epoch 941/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1578
Epoch 942/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1452
Epoch 943/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1505
Epoch 944/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1507
Epoch 945/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1521
Epoch 946/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1551
Epoch 947/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1554
```

```
Epoch 948/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1675
Epoch 949/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1505
Epoch 950/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1504
Epoch 951/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1501
Epoch 952/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1580
Epoch 953/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1586
Epoch 954/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1537
Epoch 955/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1565
Epoch 956/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1492
Epoch 957/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1532
Epoch 958/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1590
Epoch 959/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1550
Epoch 960/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1483
Epoch 961/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1471
Epoch 962/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1516
Epoch 963/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1588
Epoch 964/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1493
Epoch 965/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1506
Epoch 966/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1461
Epoch 967/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1539
Epoch 968/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1624
Epoch 969/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1565
Epoch 970/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1548
Epoch 971/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1566
```

```
Epoch 972/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1498
Epoch 973/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1529
Epoch 974/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1591
Epoch 975/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1545
Epoch 976/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.1460
Epoch 977/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1581
Epoch 978/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1575
Epoch 979/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1494
Epoch 980/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1558
Epoch 981/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1530
Epoch 982/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1445
Epoch 983/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1529
Epoch 984/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1450
Epoch 985/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1494
Epoch 986/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1509
Epoch 987/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1414
Epoch 988/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1559
Epoch 989/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1550
Epoch 990/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1503
Epoch 991/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1496
Epoch 992/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1508
Epoch 993/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1506
Epoch 994/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1482
Epoch 995/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1551
```

```
Epoch 996/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1615
Epoch 997/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1736
Epoch 998/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.1754
Epoch 999/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.1714
Epoch 1000/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.1538
Finished lambda = 0.001
Epoch 1/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.4887
Epoch 2/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.7947
Epoch 3/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6159
Epoch 4/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5300
Epoch 5/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4991
Epoch 6/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4763
Epoch 7/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4761
Epoch 8/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4651
Epoch 9/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4366
Epoch 10/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4063
Epoch 11/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4032
Epoch 12/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4115
Epoch 13/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4421
Epoch 14/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4607
Epoch 15/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4457
Epoch 16/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4180
Epoch 17/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3981
Epoch 18/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3570
Epoch 19/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3768
Epoch 20/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3689
Epoch 21/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3560
Epoch 22/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3717
Epoch 23/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3560
Epoch 24/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3582
Epoch 25/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4461
Epoch 26/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4211
Epoch 27/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4046
Epoch 28/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3618
Epoch 29/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3376
Epoch 30/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3653
Epoch 31/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3520
Epoch 32/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3440
Epoch 33/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3363
Epoch 34/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3511
Epoch 35/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3597
Epoch 36/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3456
Epoch 37/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3446
Epoch 38/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3259
Epoch 39/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3378
Epoch 40/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3222
Epoch 41/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3507
Epoch 42/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3586
Epoch 43/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.3529
Epoch 44/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3379
Epoch 45/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3303
Epoch 46/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3230
Epoch 47/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3333
Epoch 48/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3398
Epoch 49/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3231
Epoch 50/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3151
Epoch 51/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3105
Epoch 52/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3219
Epoch 53/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3330
Epoch 54/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3114
Epoch 55/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3593
Epoch 56/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3489
Epoch 57/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3277
Epoch 58/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3034
Epoch 59/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3298
Epoch 60/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3624
Epoch 61/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3687
Epoch 62/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3334
Epoch 63/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3205
Epoch 64/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3533
Epoch 65/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3558
Epoch 66/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3334
Epoch 67/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.3456
Epoch 68/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3420
Epoch 69/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3175
Epoch 70/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3176
Epoch 71/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3266
Epoch 72/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2945
Epoch 73/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3038
Epoch 74/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3079
Epoch 75/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3156
Epoch 76/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3161
Epoch 77/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3109
Epoch 78/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3183
Epoch 79/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2994
Epoch 80/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3003
Epoch 81/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3084
Epoch 82/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3209
Epoch 83/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2936
Epoch 84/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2986
Epoch 85/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3233
Epoch 86/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3035
Epoch 87/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3108
Epoch 88/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3007
Epoch 89/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3035
Epoch 90/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2822
Epoch 91/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3095
Epoch 92/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2903
Epoch 93/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2827
Epoch 94/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2945
Epoch 95/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3167
Epoch 96/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2846
Epoch 97/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2896
Epoch 98/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3049
Epoch 99/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3257
Epoch 100/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2916
Epoch 101/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3189
Epoch 102/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2933
Epoch 103/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3247
Epoch 104/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2951
Epoch 105/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3002
Epoch 106/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2824
Epoch 107/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3384
Epoch 108/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2741
Epoch 109/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2800
Epoch 110/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2805
Epoch 111/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2771
Epoch 112/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2853
Epoch 113/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2788
Epoch 114/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2871
Epoch 115/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2790
Epoch 116/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2960
Epoch 117/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2773
Epoch 118/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2729
Epoch 119/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2967
Epoch 120/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3043
Epoch 121/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2981
Epoch 122/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2903
Epoch 123/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2808
Epoch 124/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2722
Epoch 125/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2721
Epoch 126/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2803
Epoch 127/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3002
Epoch 128/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2898
Epoch 129/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2991
Epoch 130/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2872
Epoch 131/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2926
Epoch 132/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2694
Epoch 133/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2795
Epoch 134/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3005
Epoch 135/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2835
Epoch 136/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2709
Epoch 137/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2765
Epoch 138/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2873
Epoch 139/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3138
Epoch 140/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2971
Epoch 141/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2815
Epoch 142/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2687
Epoch 143/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2741
Epoch 144/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2962
Epoch 145/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2732
Epoch 146/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2687
Epoch 147/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2779
Epoch 148/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2684
Epoch 149/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2700
Epoch 150/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2771
Epoch 151/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2724
Epoch 152/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2769
Epoch 153/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2847
Epoch 154/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2696
Epoch 155/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2718
Epoch 156/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2793
Epoch 157/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2713
Epoch 158/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2727
Epoch 159/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2656
Epoch 160/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2646
Epoch 161/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2694
Epoch 162/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2741
Epoch 163/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2780
Epoch 164/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2863
Epoch 165/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2836
Epoch 166/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2751
Epoch 167/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2735
Epoch 168/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2831
Epoch 169/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2756
Epoch 170/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2754
Epoch 171/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2655
Epoch 172/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2590
Epoch 173/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2792
Epoch 174/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2796
Epoch 175/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2747
Epoch 176/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2658
Epoch 177/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2601
Epoch 178/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2806
Epoch 179/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2803
Epoch 180/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2601
Epoch 181/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2837
Epoch 182/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2661
Epoch 183/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2565
Epoch 184/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2792
Epoch 185/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2663
Epoch 186/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2869
Epoch 187/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.2754
Epoch 188/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2606
Epoch 189/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2567
Epoch 190/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2627
Epoch 191/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2783
Epoch 192/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2639
Epoch 193/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2750
Epoch 194/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2751
Epoch 195/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2665
Epoch 196/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2544
Epoch 197/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2694
Epoch 198/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2743
Epoch 199/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2783
Epoch 200/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2641
Epoch 201/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2676
Epoch 202/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2561
Epoch 203/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2634
Epoch 204/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2984
Epoch 205/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2652
Epoch 206/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2517
Epoch 207/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2660
Epoch 208/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2698
Epoch 209/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2635
Epoch 210/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2600
Epoch 211/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2638
Epoch 212/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2641
Epoch 213/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2654
Epoch 214/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2647
Epoch 215/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2613
Epoch 216/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2652
Epoch 217/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2633
Epoch 218/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2727
Epoch 219/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2648
Epoch 220/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2533
Epoch 221/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2562
Epoch 222/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2620
Epoch 223/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2624
Epoch 224/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2690
Epoch 225/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2606
Epoch 226/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2601
Epoch 227/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2579
Epoch 228/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2482
Epoch 229/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2564
Epoch 230/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2612
Epoch 231/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2889
Epoch 232/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2680
Epoch 233/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2667
Epoch 234/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2484
Epoch 235/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2593
Epoch 236/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2539
Epoch 237/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2570
Epoch 238/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2918
Epoch 239/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2661
Epoch 240/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2573
Epoch 241/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2561
Epoch 242/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2707
Epoch 243/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2673
Epoch 244/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2800
Epoch 245/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2518
Epoch 246/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2584
Epoch 247/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2528
Epoch 248/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2575
Epoch 249/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2596
Epoch 250/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2584
Epoch 251/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2605
Epoch 252/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2468
Epoch 253/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2526
Epoch 254/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2695
Epoch 255/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2641
Epoch 256/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2602
Epoch 257/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2919
Epoch 258/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2728
Epoch 259/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2527
Epoch 260/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2540
Epoch 261/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2679
Epoch 262/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2653
Epoch 263/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2528
Epoch 264/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2496
Epoch 265/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2681
Epoch 266/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2748
Epoch 267/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2691
Epoch 268/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2595
Epoch 269/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2501
Epoch 270/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2638
Epoch 271/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2488
Epoch 272/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2590
Epoch 273/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2693
Epoch 274/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2487
Epoch 275/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2879
Epoch 276/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2550
Epoch 277/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2592
Epoch 278/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2575
Epoch 279/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2643
Epoch 280/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2568
Epoch 281/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2578
Epoch 282/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2498
Epoch 283/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.2571
Epoch 284/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2585
Epoch 285/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2579
Epoch 286/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2528
Epoch 287/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2594
Epoch 288/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2729
Epoch 289/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2664
Epoch 290/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2643
Epoch 291/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2490
Epoch 292/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2434
Epoch 293/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2504
Epoch 294/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2578
Epoch 295/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2623
Epoch 296/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2620
Epoch 297/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2588
Epoch 298/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2675
Epoch 299/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2444
Epoch 300/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2785
Epoch 301/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2503
Epoch 302/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2636
Epoch 303/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2643
Epoch 304/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2736
Epoch 305/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2964
Epoch 306/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2600
Epoch 307/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.2774
Epoch 308/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2600
Epoch 309/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2554
Epoch 310/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2507
Epoch 311/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2488
Epoch 312/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2486
Epoch 313/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2906
Epoch 314/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2616
Epoch 315/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2615
Epoch 316/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2564
Epoch 317/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2498
Epoch 318/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2488
Epoch 319/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2740
Epoch 320/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2479
Epoch 321/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2435
Epoch 322/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2432
Epoch 323/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2625
Epoch 324/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2695
Epoch 325/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2709
Epoch 326/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2469
Epoch 327/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2454
Epoch 328/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2682
Epoch 329/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2556
Epoch 330/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2563
Epoch 331/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2618
Epoch 332/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2738
Epoch 333/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2578
Epoch 334/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2636
Epoch 335/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2584
Epoch 336/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2753
Epoch 337/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2667
Epoch 338/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2601
Epoch 339/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2483
Epoch 340/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2725
Epoch 341/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2638
Epoch 342/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2609
Epoch 343/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2503
Epoch 344/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2435
Epoch 345/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2478
Epoch 346/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2632
Epoch 347/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2413
Epoch 348/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2544
Epoch 349/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2412
Epoch 350/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2631
Epoch 351/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2413
Epoch 352/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2606
Epoch 353/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2671
Epoch 354/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2560
Epoch 355/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2726
Epoch 356/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2537
Epoch 357/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2434
Epoch 358/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2699
Epoch 359/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2456
Epoch 360/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2712
Epoch 361/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2578
Epoch 362/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2887
Epoch 363/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2854
Epoch 364/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2674
Epoch 365/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2514
Epoch 366/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2513
Epoch 367/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2746
Epoch 368/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2747
Epoch 369/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2498
Epoch 370/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2489
Epoch 371/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2508
Epoch 372/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2364
Epoch 373/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2547
Epoch 374/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2383
Epoch 375/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2511
Epoch 376/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2466
Epoch 377/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2412
Epoch 378/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2559
Epoch 379/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2437
Epoch 380/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2488
Epoch 381/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2475
Epoch 382/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2464
Epoch 383/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2670
Epoch 384/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2800
Epoch 385/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2617
Epoch 386/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2426
Epoch 387/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2533
Epoch 388/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2661
Epoch 389/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2635
Epoch 390/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2408
Epoch 391/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2482
Epoch 392/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2569
Epoch 393/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2386
Epoch 394/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2495
Epoch 395/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2407
Epoch 396/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2408
Epoch 397/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2595
Epoch 398/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2593
Epoch 399/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2553
Epoch 400/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2609
Epoch 401/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2553
Epoch 402/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2450
Epoch 403/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.2569
Epoch 404/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2570
Epoch 405/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2564
Epoch 406/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2358
Epoch 407/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2354
Epoch 408/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2492
Epoch 409/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2510
Epoch 410/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2410
Epoch 411/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2705
Epoch 412/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2500
Epoch 413/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2373
Epoch 414/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2435
Epoch 415/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2616
Epoch 416/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2525
Epoch 417/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2561
Epoch 418/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2586
Epoch 419/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2545
Epoch 420/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2499
Epoch 421/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2672
Epoch 422/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2353
Epoch 423/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2391
Epoch 424/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2473
Epoch 425/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2449
Epoch 426/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2405
Epoch 427/1000
```

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13/13 [==============================] - 0s 4ms/step - loss: 0.2400
Epoch 428/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2449
Epoch 429/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2364
Epoch 430/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2378
Epoch 431/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2360
Epoch 432/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2445
Epoch 433/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2462
Epoch 434/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2504
Epoch 435/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2455
Epoch 436/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2678
Epoch 437/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2632
Epoch 438/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2504
Epoch 439/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2432
Epoch 440/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2458
Epoch 441/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2448
Epoch 442/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2400
Epoch 443/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2629
Epoch 444/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2405
Epoch 445/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2611
Epoch 446/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2648
Epoch 447/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2939
Epoch 448/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2452
Epoch 449/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2321
Epoch 450/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2363
Epoch 451/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.2472
Epoch 452/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2394
Epoch 453/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2387
Epoch 454/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2373
Epoch 455/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2383
Epoch 456/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2410
Epoch 457/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2328
Epoch 458/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2508
Epoch 459/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2407
Epoch 460/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2385
Epoch 461/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2616
Epoch 462/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2420
Epoch 463/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2382
Epoch 464/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2448
Epoch 465/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2504
Epoch 466/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2577
Epoch 467/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2492
Epoch 468/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2464
Epoch 469/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2335
Epoch 470/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2444
Epoch 471/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2558
Epoch 472/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2628
Epoch 473/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2500
Epoch 474/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2561
Epoch 475/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.2550
Epoch 476/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2445
Epoch 477/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2627
Epoch 478/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2382
Epoch 479/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2497
Epoch 480/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2403
Epoch 481/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2397
Epoch 482/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2462
Epoch 483/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2380
Epoch 484/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2496
Epoch 485/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2341
Epoch 486/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2354
Epoch 487/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2446
Epoch 488/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2531
Epoch 489/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2325
Epoch 490/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2684
Epoch 491/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2498
Epoch 492/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2579
Epoch 493/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2474
Epoch 494/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2443
Epoch 495/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2402
Epoch 496/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2610
Epoch 497/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2524
Epoch 498/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2309
Epoch 499/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2316
Epoch 500/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2554
Epoch 501/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2426
Epoch 502/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2469
Epoch 503/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2586
Epoch 504/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2434
Epoch 505/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2349
Epoch 506/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2417
Epoch 507/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2423
Epoch 508/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2325
Epoch 509/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2506
Epoch 510/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2414
Epoch 511/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2281
Epoch 512/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2615
Epoch 513/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2466
Epoch 514/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2527
Epoch 515/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2626
Epoch 516/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2465
Epoch 517/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2327
Epoch 518/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2332
Epoch 519/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2452
Epoch 520/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2321
Epoch 521/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2464
Epoch 522/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2609
Epoch 523/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2537
Epoch 524/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2444
Epoch 525/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2454
Epoch 526/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2386
Epoch 527/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2503
Epoch 528/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2617
Epoch 529/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2843
Epoch 530/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2692
Epoch 531/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2460
Epoch 532/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2337
Epoch 533/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2344
Epoch 534/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2491
Epoch 535/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2367
Epoch 536/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2357
Epoch 537/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2612
Epoch 538/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2328
Epoch 539/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2255
Epoch 540/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2572
Epoch 541/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2541
Epoch 542/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2671
Epoch 543/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2553
Epoch 544/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2462
Epoch 545/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2463
Epoch 546/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2651
Epoch 547/1000
```

```
13/13 [==============================] - 0s 4ms/step - loss: 0.2532
Epoch 548/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2443
Epoch 549/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2399
Epoch 550/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2355
Epoch 551/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2454
Epoch 552/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2438
Epoch 553/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2343
Epoch 554/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2389
Epoch 555/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2409
Epoch 556/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2248
Epoch 557/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2315
Epoch 558/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2424
Epoch 559/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2582
Epoch 560/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2552
Epoch 561/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2392
Epoch 562/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2518
Epoch 563/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2296
Epoch 564/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2423
Epoch 565/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2346
Epoch 566/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2342
Epoch 567/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2471
Epoch 568/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2330
Epoch 569/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2397
Epoch 570/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2283
Epoch 571/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2418
Epoch 572/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2382
Epoch 573/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2442
Epoch 574/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2335
Epoch 575/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2367
Epoch 576/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2277
Epoch 577/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2395
Epoch 578/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2603
Epoch 579/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2301
Epoch 580/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2313
Epoch 581/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2450
Epoch 582/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2500
Epoch 583/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2311
Epoch 584/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2429
Epoch 585/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2329
Epoch 586/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2245
Epoch 587/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2313
Epoch 588/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2322
Epoch 589/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2269
Epoch 590/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2333
Epoch 591/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2522
Epoch 592/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2364
Epoch 593/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2329
Epoch 594/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2228
Epoch 595/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2820
Epoch 596/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2668
Epoch 597/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2413
Epoch 598/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2448
Epoch 599/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2390
Epoch 600/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2366
Epoch 601/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2245
Epoch 602/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2445
Epoch 603/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2743
Epoch 604/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2642
Epoch 605/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2378
Epoch 606/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2433
Epoch 607/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2302
Epoch 608/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2481
Epoch 609/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2356
Epoch 610/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2379
Epoch 611/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2629
Epoch 612/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2389
Epoch 613/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2414
Epoch 614/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2402
Epoch 615/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2316
Epoch 616/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2385
Epoch 617/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2397
Epoch 618/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2352
Epoch 619/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2253
Epoch 620/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2218
Epoch 621/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2407
Epoch 622/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2301
Epoch 623/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2476
Epoch 624/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2301
Epoch 625/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2331
Epoch 626/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2387
Epoch 627/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2347
Epoch 628/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2320
Epoch 629/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2314
Epoch 630/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2271
Epoch 631/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2385
Epoch 632/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2352
Epoch 633/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2366
Epoch 634/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2325
Epoch 635/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2425
Epoch 636/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2644
Epoch 637/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2497
Epoch 638/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2471
Epoch 639/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2270
Epoch 640/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2334
Epoch 641/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2302
Epoch 642/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2384
Epoch 643/1000
```

```
13/13 [==============================] - 0s 4ms/step - loss: 0.2365
Epoch 644/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2362
Epoch 645/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2460
Epoch 646/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2305
Epoch 647/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2367
Epoch 648/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2255
Epoch 649/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2348
Epoch 650/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2537
Epoch 651/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2377
Epoch 652/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2329
Epoch 653/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2212
Epoch 654/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2405
Epoch 655/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2316
Epoch 656/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2244
Epoch 657/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2280
Epoch 658/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2265
Epoch 659/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2217
Epoch 660/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2351
Epoch 661/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2234
Epoch 662/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2297
Epoch 663/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2287
Epoch 664/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2537
Epoch 665/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2334
Epoch 666/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2385
Epoch 667/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2348
Epoch 668/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2443
Epoch 669/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2447
Epoch 670/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2217
Epoch 671/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2320
Epoch 672/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2542
Epoch 673/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2308
Epoch 674/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2357
Epoch 675/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2376
Epoch 676/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2288
Epoch 677/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2243
Epoch 678/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2216
Epoch 679/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2363
Epoch 680/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2322
Epoch 681/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2361
Epoch 682/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2318
Epoch 683/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2287
Epoch 684/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2226
Epoch 685/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2378
Epoch 686/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2428
Epoch 687/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2273
Epoch 688/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2278
Epoch 689/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2287
Epoch 690/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2282
Epoch 691/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2288
Epoch 692/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2276
Epoch 693/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2293
Epoch 694/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2335
Epoch 695/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2300
Epoch 696/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2249
Epoch 697/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2279
Epoch 698/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2341
Epoch 699/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2225
Epoch 700/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2300
Epoch 701/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2200
Epoch 702/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2195
Epoch 703/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2355
Epoch 704/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2407
Epoch 705/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2296
Epoch 706/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2239
Epoch 707/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2318
Epoch 708/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2419
Epoch 709/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2438
Epoch 710/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2251
Epoch 711/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2309
Epoch 712/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2541
Epoch 713/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2406
Epoch 714/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2223
Epoch 715/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2201
Epoch 716/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2311
Epoch 717/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2446
Epoch 718/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2268
Epoch 719/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2434
Epoch 720/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2284
Epoch 721/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2355
Epoch 722/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2216
Epoch 723/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2356
Epoch 724/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2228
Epoch 725/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2337
Epoch 726/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2289
Epoch 727/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2364
Epoch 728/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2410
Epoch 729/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2280
Epoch 730/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2242
Epoch 731/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2416
Epoch 732/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2303
Epoch 733/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2363
Epoch 734/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2381
Epoch 735/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2343
Epoch 736/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2324
Epoch 737/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2306
Epoch 738/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2212
Epoch 739/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2472
Epoch 740/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2357
Epoch 741/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2545
Epoch 742/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2449
Epoch 743/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2217
Epoch 744/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2232
Epoch 745/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2330
Epoch 746/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2412
Epoch 747/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2389
Epoch 748/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2340
Epoch 749/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2329
Epoch 750/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2386
Epoch 751/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2275
Epoch 752/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2332
Epoch 753/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2187
Epoch 754/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2307
Epoch 755/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2266
Epoch 756/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2251
Epoch 757/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2315
Epoch 758/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2266
Epoch 759/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2236
Epoch 760/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2401
Epoch 761/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2431
Epoch 762/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2319
Epoch 763/1000
```

```
13/13 [==============================] - 0s 4ms/step - loss: 0.2277
Epoch 764/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2523
Epoch 765/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2383
Epoch 766/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2362
Epoch 767/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2333
Epoch 768/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2374
Epoch 769/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2191
Epoch 770/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2201
Epoch 771/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2346
Epoch 772/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2207
Epoch 773/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2307
Epoch 774/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2415
Epoch 775/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2480
Epoch 776/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2427
Epoch 777/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2226
Epoch 778/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2274
Epoch 779/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2393
Epoch 780/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2316
Epoch 781/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2360
Epoch 782/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2194
Epoch 783/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2290
Epoch 784/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2271
Epoch 785/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2240
Epoch 786/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2441
Epoch 787/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.2480
Epoch 788/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2155
Epoch 789/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2213
Epoch 790/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2240
Epoch 791/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2255
Epoch 792/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2294
Epoch 793/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2198
Epoch 794/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2319
Epoch 795/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2169
Epoch 796/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2390
Epoch 797/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2281
Epoch 798/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2324
Epoch 799/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2183
Epoch 800/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2152
Epoch 801/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2228
Epoch 802/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2162
Epoch 803/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2182
Epoch 804/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2223
Epoch 805/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2304
Epoch 806/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2248
Epoch 807/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2460
Epoch 808/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2547
Epoch 809/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2359
Epoch 810/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2245
Epoch 811/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2224
Epoch 812/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2189
Epoch 813/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2203
Epoch 814/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2263
Epoch 815/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2176
Epoch 816/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2202
Epoch 817/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2299
Epoch 818/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2367
Epoch 819/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2642
Epoch 820/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2803
Epoch 821/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2474
Epoch 822/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2318
Epoch 823/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2275
Epoch 824/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2407
Epoch 825/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2327
Epoch 826/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2186
Epoch 827/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2222
Epoch 828/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2474
Epoch 829/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2372
Epoch 830/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2284
Epoch 831/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2329
Epoch 832/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2307
Epoch 833/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2382
Epoch 834/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2240
Epoch 835/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2350
Epoch 836/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2152
Epoch 837/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2193
Epoch 838/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2178
Epoch 839/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2286
Epoch 840/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2240
Epoch 841/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2376
Epoch 842/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2407
Epoch 843/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2402
Epoch 844/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2171
Epoch 845/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2288
Epoch 846/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2238
Epoch 847/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2356
Epoch 848/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2237
Epoch 849/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2212
Epoch 850/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2196
Epoch 851/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2211
Epoch 852/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2321
Epoch 853/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2166
Epoch 854/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2278
Epoch 855/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2295
Epoch 856/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2205
Epoch 857/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2324
Epoch 858/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2211
Epoch 859/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2291
Epoch 860/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2217
Epoch 861/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2264
Epoch 862/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2207
Epoch 863/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2172
Epoch 864/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2645
Epoch 865/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2141
Epoch 866/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2284
Epoch 867/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2350
Epoch 868/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2147
Epoch 869/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2257
Epoch 870/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2455
Epoch 871/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2240
Epoch 872/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2168
Epoch 873/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2118
Epoch 874/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2201
Epoch 875/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2169
Epoch 876/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2210
Epoch 877/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2245
Epoch 878/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2229
Epoch 879/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2236
Epoch 880/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2220
Epoch 881/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2483
Epoch 882/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2266
Epoch 883/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.2498
Epoch 884/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2208
Epoch 885/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2339
Epoch 886/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2193
Epoch 887/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2172
Epoch 888/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2284
Epoch 889/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2224
Epoch 890/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2220
Epoch 891/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2212
Epoch 892/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2136
Epoch 893/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2337
Epoch 894/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2264
Epoch 895/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2330
Epoch 896/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2417
Epoch 897/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2455
Epoch 898/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2388
Epoch 899/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2360
Epoch 900/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2188
Epoch 901/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2176
Epoch 902/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2218
Epoch 903/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2210
Epoch 904/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2187
Epoch 905/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2268
Epoch 906/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2371
Epoch 907/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.2417
Epoch 908/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2359
Epoch 909/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2163
Epoch 910/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2201
Epoch 911/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2338
Epoch 912/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2328
Epoch 913/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2200
Epoch 914/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2241
Epoch 915/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2216
Epoch 916/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2247
Epoch 917/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2269
Epoch 918/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2097
Epoch 919/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2288
Epoch 920/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2311
Epoch 921/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2256
Epoch 922/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2331
Epoch 923/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2274
Epoch 924/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2231
Epoch 925/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2187
Epoch 926/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2305
Epoch 927/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2289
Epoch 928/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2198
Epoch 929/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2242
Epoch 930/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2250
Epoch 931/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.2304
Epoch 932/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2380
Epoch 933/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2341
Epoch 934/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2247
Epoch 935/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2184
Epoch 936/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2141
Epoch 937/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2289
Epoch 938/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2357
Epoch 939/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2224
Epoch 940/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2304
Epoch 941/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2195
Epoch 942/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2152
Epoch 943/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2170
Epoch 944/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2233
Epoch 945/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2180
Epoch 946/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2208
Epoch 947/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2318
Epoch 948/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2295
Epoch 949/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2165
Epoch 950/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2121
Epoch 951/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2133
Epoch 952/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2369
Epoch 953/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2243
Epoch 954/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2267
Epoch 955/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.2148
Epoch 956/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2183
Epoch 957/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2261
Epoch 958/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2436
Epoch 959/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2156
Epoch 960/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2192
Epoch 961/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2169
Epoch 962/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2213
Epoch 963/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2270
Epoch 964/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2190
Epoch 965/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2220
Epoch 966/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2323
Epoch 967/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2295
Epoch 968/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2384
Epoch 969/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2391
Epoch 970/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2178
Epoch 971/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2133
Epoch 972/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2157
Epoch 973/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2138
Epoch 974/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2120
Epoch 975/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2169
Epoch 976/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2236
Epoch 977/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2259
Epoch 978/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2185
Epoch 979/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.2188
Epoch 980/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2210
Epoch 981/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2097
Epoch 982/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2217
Epoch 983/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2284
Epoch 984/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2144
Epoch 985/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2173
Epoch 986/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2212
Epoch 987/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2123
Epoch 988/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2157
Epoch 989/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2375
Epoch 990/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2285
Epoch 991/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2383
Epoch 992/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2293
Epoch 993/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2309
Epoch 994/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2335
Epoch 995/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2322
Epoch 996/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2391
Epoch 997/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2348
Epoch 998/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2433
Epoch 999/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2373
Epoch 1000/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2322
Finished lambda = 0.01
Epoch 1/1000
13/13 [==============================] - 0s 1ms/step - loss: 3.0747
Epoch 2/1000
13/13 [==============================] - 0s 2ms/step - loss: 1.3029
```

```
Epoch 3/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.9929
Epoch 4/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8433
Epoch 5/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7880
Epoch 6/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.7536
Epoch 7/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7371
Epoch 8/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7107
Epoch 9/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.6678
Epoch 10/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.6252
Epoch 11/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6112
Epoch 12/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6137
Epoch 13/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6009
Epoch 14/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.6011
Epoch 15/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5670
Epoch 16/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6132
Epoch 17/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.5749
Epoch 18/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5784
Epoch 19/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5563
Epoch 20/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5225
Epoch 21/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.5378
Epoch 22/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5401
Epoch 23/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5363
Epoch 24/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5324
Epoch 25/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5579
Epoch 26/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6280
```

```
Epoch 27/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5199
Epoch 28/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4948
Epoch 29/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4888
Epoch 30/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5123
Epoch 31/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5159
Epoch 32/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5261
Epoch 33/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5131
Epoch 34/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5373
Epoch 35/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5253
Epoch 36/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5117
Epoch 37/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4785
Epoch 38/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4753
Epoch 39/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4653
Epoch 40/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4723
Epoch 41/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4891
Epoch 42/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4702
Epoch 43/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4732
Epoch 44/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4776
Epoch 45/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4861
Epoch 46/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4719
Epoch 47/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4354
Epoch 48/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4829
Epoch 49/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4672
Epoch 50/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4401
```

```
Epoch 51/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4549
Epoch 52/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4391
Epoch 53/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4545
Epoch 54/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4341
Epoch 55/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4627
Epoch 56/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4228
Epoch 57/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4406
Epoch 58/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4350
Epoch 59/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4590
Epoch 60/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4822
Epoch 61/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4671
Epoch 62/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4562
Epoch 63/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4280
Epoch 64/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4492
Epoch 65/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4325
Epoch 66/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4285
Epoch 67/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4278
Epoch 68/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4370
Epoch 69/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4308
Epoch 70/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4205
Epoch 71/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4119
Epoch 72/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4073
Epoch 73/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4198
Epoch 74/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4399
```

```
Epoch 75/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4173
Epoch 76/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4132
Epoch 77/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4055
Epoch 78/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4231
Epoch 79/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4440
Epoch 80/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4192
Epoch 81/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4298
Epoch 82/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4079
Epoch 83/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3980
Epoch 84/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3879
Epoch 85/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4066
Epoch 86/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4000
Epoch 87/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4279
Epoch 88/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4109
Epoch 89/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3996
Epoch 90/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3867
Epoch 91/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4078
Epoch 92/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3978
Epoch 93/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3892
Epoch 94/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3779
Epoch 95/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3963
Epoch 96/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3768
Epoch 97/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3881
Epoch 98/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3877
```

```
Epoch 99/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4175
Epoch 100/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4077
Epoch 101/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4039
Epoch 102/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3933
Epoch 103/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4009
Epoch 104/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3857
Epoch 105/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4077
Epoch 106/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3677
Epoch 107/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4007
Epoch 108/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4203
Epoch 109/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3973
Epoch 110/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3845
Epoch 111/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3824
Epoch 112/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3772
Epoch 113/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3690
Epoch 114/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3707
Epoch 115/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3662
Epoch 116/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3780
Epoch 117/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3907
Epoch 118/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3794
Epoch 119/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3938
Epoch 120/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4135
Epoch 121/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4511
Epoch 122/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4021
```

```
Epoch 123/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3951
Epoch 124/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3796
Epoch 125/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3678
Epoch 126/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3692
Epoch 127/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3837
Epoch 128/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3719
Epoch 129/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3816
Epoch 130/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3767
Epoch 131/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3858
Epoch 132/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3643
Epoch 133/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3615
Epoch 134/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3757
Epoch 135/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3786
Epoch 136/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3855
Epoch 137/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3661
Epoch 138/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3872
Epoch 139/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3924
Epoch 140/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3909
Epoch 141/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3643
Epoch 142/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3576
Epoch 143/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3714
Epoch 144/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3759
Epoch 145/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3635
Epoch 146/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3615
```

```
Epoch 147/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3911
Epoch 148/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3709
Epoch 149/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3614
Epoch 150/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3586
Epoch 151/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3585
Epoch 152/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3561
Epoch 153/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3813
Epoch 154/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3619
Epoch 155/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3649
Epoch 156/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3631
Epoch 157/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3582
Epoch 158/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3640
Epoch 159/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3485
Epoch 160/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3717
Epoch 161/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3803
Epoch 162/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3586
Epoch 163/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3544
Epoch 164/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3660
Epoch 165/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3993
Epoch 166/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4098
Epoch 167/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4308
Epoch 168/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3903
Epoch 169/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3753
Epoch 170/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3902
```

```
Epoch 171/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3694
Epoch 172/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3572
Epoch 173/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3820
Epoch 174/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3957
Epoch 175/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3766
Epoch 176/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3955
Epoch 177/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3758
Epoch 178/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3532
Epoch 179/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3594
Epoch 180/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3514
Epoch 181/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3787
Epoch 182/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3697
Epoch 183/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3533
Epoch 184/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3442
Epoch 185/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3461
Epoch 186/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3525
Epoch 187/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3613
Epoch 188/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3605
Epoch 189/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3438
Epoch 190/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3446
Epoch 191/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3566
Epoch 192/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3631
Epoch 193/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3648
Epoch 194/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3652
```

```
Epoch 195/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3450
Epoch 196/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3442
Epoch 197/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3720
Epoch 198/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3434
Epoch 199/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3497
Epoch 200/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3566
Epoch 201/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3765
Epoch 202/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3436
Epoch 203/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3385
Epoch 204/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3548
Epoch 205/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4030
Epoch 206/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3728
Epoch 207/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3580
Epoch 208/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3600
Epoch 209/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3791
Epoch 210/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3554
Epoch 211/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3624
Epoch 212/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3596
Epoch 213/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3528
Epoch 214/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3519
Epoch 215/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3416
Epoch 216/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3580
Epoch 217/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3424
Epoch 218/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3612
```

```
Epoch 219/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3465
Epoch 220/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3457
Epoch 221/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3360
Epoch 222/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3572
Epoch 223/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3500
Epoch 224/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3893
Epoch 225/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3804
Epoch 226/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3567
Epoch 227/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3602
Epoch 228/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3329
Epoch 229/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3503
Epoch 230/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3516
Epoch 231/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3517
Epoch 232/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3583
Epoch 233/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3363
Epoch 234/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3360
Epoch 235/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3358
Epoch 236/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3414
Epoch 237/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3392
Epoch 238/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3709
Epoch 239/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3593
Epoch 240/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3367
Epoch 241/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3393
Epoch 242/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3365
```

```
Epoch 243/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3369
Epoch 244/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3468
Epoch 245/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3472
Epoch 246/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3458
Epoch 247/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3313
Epoch 248/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3407
Epoch 249/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3521
Epoch 250/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3412
Epoch 251/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3704
Epoch 252/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3543
Epoch 253/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3425
Epoch 254/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3580
Epoch 255/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3592
Epoch 256/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3357
Epoch 257/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3556
Epoch 258/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3444
Epoch 259/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3462
Epoch 260/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3388
Epoch 261/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3560
Epoch 262/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4042
Epoch 263/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3634
Epoch 264/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3352
Epoch 265/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3447
Epoch 266/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3742
```

```
Epoch 267/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3910
Epoch 268/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3617
Epoch 269/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3334
Epoch 270/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3425
Epoch 271/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3341
Epoch 272/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3346
Epoch 273/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3531
Epoch 274/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3263
Epoch 275/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3432
Epoch 276/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3320
Epoch 277/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3291
Epoch 278/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3319
Epoch 279/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3497
Epoch 280/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3418
Epoch 281/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3284
Epoch 282/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3330
Epoch 283/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3388
Epoch 284/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3451
Epoch 285/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3696
Epoch 286/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3386
Epoch 287/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3480
Epoch 288/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3440
Epoch 289/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3327
Epoch 290/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3536
```

```
Epoch 291/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3434
Epoch 292/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3260
Epoch 293/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3390
Epoch 294/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3573
Epoch 295/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3478
Epoch 296/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3311
Epoch 297/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3295
Epoch 298/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3466
Epoch 299/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3404
Epoch 300/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3817
Epoch 301/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3411
Epoch 302/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3372
Epoch 303/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3265
Epoch 304/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3286
Epoch 305/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3379
Epoch 306/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3374
Epoch 307/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3393
Epoch 308/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3401
Epoch 309/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3263
Epoch 310/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3299
Epoch 311/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3181
Epoch 312/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3202
Epoch 313/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3444
Epoch 314/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3382
```

```
Epoch 315/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3359
Epoch 316/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3503
Epoch 317/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3354
Epoch 318/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3276
Epoch 319/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3359
Epoch 320/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3239
Epoch 321/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3312
Epoch 322/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3254
Epoch 323/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3388
Epoch 324/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3462
Epoch 325/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3512
Epoch 326/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3279
Epoch 327/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3197
Epoch 328/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3371
Epoch 329/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3258
Epoch 330/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3119
Epoch 331/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3160
Epoch 332/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3222
Epoch 333/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3521
Epoch 334/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3389
Epoch 335/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3308
Epoch 336/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3369
Epoch 337/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3485
Epoch 338/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3181
```

```
Epoch 339/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3173
Epoch 340/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3333
Epoch 341/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3273
Epoch 342/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3430
Epoch 343/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3294
Epoch 344/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3224
Epoch 345/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3210
Epoch 346/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3267
Epoch 347/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3359
Epoch 348/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3467
Epoch 349/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3143
Epoch 350/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3377
Epoch 351/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3183
Epoch 352/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3420
Epoch 353/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3303
Epoch 354/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3217
Epoch 355/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3257
Epoch 356/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3154
Epoch 357/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3299
Epoch 358/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3420
Epoch 359/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3200
Epoch 360/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3294
Epoch 361/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3504
Epoch 362/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3978
```

```
Epoch 363/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3650
Epoch 364/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3331
Epoch 365/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3313
Epoch 366/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3188
Epoch 367/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3308
Epoch 368/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3506
Epoch 369/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3503
Epoch 370/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3282
Epoch 371/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3192
Epoch 372/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3179
Epoch 373/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3344
Epoch 374/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3136
Epoch 375/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3339
Epoch 376/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3193
Epoch 377/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3120
Epoch 378/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3234
Epoch 379/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3254
Epoch 380/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3262
Epoch 381/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3400
Epoch 382/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3170
Epoch 383/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3292
Epoch 384/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3187
Epoch 385/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3203
Epoch 386/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3096
```

```
Epoch 387/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3317
Epoch 388/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3404
Epoch 389/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3233
Epoch 390/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3101
Epoch 391/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3277
Epoch 392/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3357
Epoch 393/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3094
Epoch 394/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3168
Epoch 395/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3326
Epoch 396/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3229
Epoch 397/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3487
Epoch 398/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3284
Epoch 399/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3146
Epoch 400/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3178
Epoch 401/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3111
Epoch 402/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3090
Epoch 403/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3129
Epoch 404/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3163
Epoch 405/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3125
Epoch 406/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3159
Epoch 407/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3132
Epoch 408/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3145
Epoch 409/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3349
Epoch 410/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3165
```

```
Epoch 411/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3428
Epoch 412/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3275
Epoch 413/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3068
Epoch 414/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3188
Epoch 415/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3195
Epoch 416/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3431
Epoch 417/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3344
Epoch 418/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3110
Epoch 419/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3205
Epoch 420/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3035
Epoch 421/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3506
Epoch 422/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3413
Epoch 423/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3203
Epoch 424/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3189
Epoch 425/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3263
Epoch 426/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3154
Epoch 427/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3148
Epoch 428/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3160
Epoch 429/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3168
Epoch 430/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3069
Epoch 431/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3062
Epoch 432/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3096
Epoch 433/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3419
Epoch 434/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3591
```

```
Epoch 435/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3488
Epoch 436/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3521
Epoch 437/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3330
Epoch 438/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3322
Epoch 439/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3055
Epoch 440/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3063
Epoch 441/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3159
Epoch 442/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3270
Epoch 443/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3191
Epoch 444/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3133
Epoch 445/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3239
Epoch 446/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3118
Epoch 447/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3383
Epoch 448/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3302
Epoch 449/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3083
Epoch 450/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3117
Epoch 451/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3085
Epoch 452/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3289
Epoch 453/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3238
Epoch 454/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3106
Epoch 455/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3087
Epoch 456/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3072
Epoch 457/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3020
Epoch 458/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3299
```

```
Epoch 459/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3170
Epoch 460/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3237
Epoch 461/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3257
Epoch 462/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3189
Epoch 463/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3158
Epoch 464/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3154
Epoch 465/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3216
Epoch 466/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3479
Epoch 467/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3514
Epoch 468/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3584
Epoch 469/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3095
Epoch 470/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3101
Epoch 471/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3171
Epoch 472/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3234
Epoch 473/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3147
Epoch 474/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3233
Epoch 475/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3166
Epoch 476/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3134
Epoch 477/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3405
Epoch 478/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3157
Epoch 479/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3059
Epoch 480/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3127
Epoch 481/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3047
Epoch 482/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3265
```

```
Epoch 483/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3154
Epoch 484/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3169
Epoch 485/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3098
Epoch 486/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3041
Epoch 487/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3023
Epoch 488/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3132
Epoch 489/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3005
Epoch 490/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3167
Epoch 491/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3306
Epoch 492/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3144
Epoch 493/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3028
Epoch 494/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3128
Epoch 495/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3036
Epoch 496/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3265
Epoch 497/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3311
Epoch 498/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2980
Epoch 499/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3035
Epoch 500/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3243
Epoch 501/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3230
Epoch 502/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3174
Epoch 503/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3331
Epoch 504/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3173
Epoch 505/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3048
Epoch 506/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3183
```

```
Epoch 507/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3079
Epoch 508/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2933
Epoch 509/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3031
Epoch 510/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3006
Epoch 511/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3047
Epoch 512/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3221
Epoch 513/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2998
Epoch 514/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3077
Epoch 515/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3022
Epoch 516/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3124
Epoch 517/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3084
Epoch 518/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3180
Epoch 519/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3195
Epoch 520/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2988
Epoch 521/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3011
Epoch 522/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3191
Epoch 523/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3209
Epoch 524/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3043
Epoch 525/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3172
Epoch 526/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3132
Epoch 527/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3062
Epoch 528/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3107
Epoch 529/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3495
Epoch 530/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3183
```

```
Epoch 531/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3230
Epoch 532/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3114
Epoch 533/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2985
Epoch 534/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3265
Epoch 535/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3200
Epoch 536/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3079
Epoch 537/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3586
Epoch 538/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3209
Epoch 539/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2946
Epoch 540/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3151
Epoch 541/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3265
Epoch 542/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3297
Epoch 543/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3176
Epoch 544/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3109
Epoch 545/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3033
Epoch 546/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3208
Epoch 547/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3347
Epoch 548/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3134
Epoch 549/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2954
Epoch 550/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3015
Epoch 551/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2957
Epoch 552/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3070
Epoch 553/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2918
Epoch 554/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3121
```

```
Epoch 555/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3453
Epoch 556/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3336
Epoch 557/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3204
Epoch 558/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3091
Epoch 559/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3226
Epoch 560/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3070
Epoch 561/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2953
Epoch 562/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3058
Epoch 563/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3203
Epoch 564/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3274
Epoch 565/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3077
Epoch 566/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3020
Epoch 567/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3044
Epoch 568/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2970
Epoch 569/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3055
Epoch 570/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2993
Epoch 571/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3173
Epoch 572/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2986
Epoch 573/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2993
Epoch 574/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3036
Epoch 575/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2922
Epoch 576/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2914
Epoch 577/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3151
Epoch 578/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3550
```

```
Epoch 579/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2946
Epoch 580/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3024
Epoch 581/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3277
Epoch 582/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3074
Epoch 583/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3123
Epoch 584/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3039
Epoch 585/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3194
Epoch 586/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3047
Epoch 587/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3001
Epoch 588/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2973
Epoch 589/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2899
Epoch 590/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2931
Epoch 591/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3086
Epoch 592/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3075
Epoch 593/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2965
Epoch 594/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2962
Epoch 595/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4034
Epoch 596/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3768
Epoch 597/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3273
Epoch 598/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3137
Epoch 599/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3107
Epoch 600/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3082
Epoch 601/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2931
Epoch 602/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2938
```

```
Epoch 603/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3229
Epoch 604/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3136
Epoch 605/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3287
Epoch 606/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3176
Epoch 607/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2975
Epoch 608/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3015
Epoch 609/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3131
Epoch 610/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3224
Epoch 611/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3182
Epoch 612/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3333
Epoch 613/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3201
Epoch 614/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3101
Epoch 615/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3082
Epoch 616/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2993
Epoch 617/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2890
Epoch 618/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3229
Epoch 619/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3134
Epoch 620/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3101
Epoch 621/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3149
Epoch 622/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3099
Epoch 623/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2953
Epoch 624/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2911
Epoch 625/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2859
Epoch 626/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3012
```

```
Epoch 627/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3119
Epoch 628/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3220
Epoch 629/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3136
Epoch 630/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3089
Epoch 631/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3103
Epoch 632/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3292
Epoch 633/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3372
Epoch 634/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3033
Epoch 635/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3340
Epoch 636/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3206
Epoch 637/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3102
Epoch 638/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3004
Epoch 639/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2979
Epoch 640/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2924
Epoch 641/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2917
Epoch 642/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3073
Epoch 643/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3169
Epoch 644/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2949
Epoch 645/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3102
Epoch 646/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3222
Epoch 647/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3319
Epoch 648/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3124
Epoch 649/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3107
Epoch 650/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3047
```

```
Epoch 651/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3042
Epoch 652/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2905
Epoch 653/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3161
Epoch 654/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3146
Epoch 655/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2960
Epoch 656/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2891
Epoch 657/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3069
Epoch 658/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3077
Epoch 659/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3205
Epoch 660/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3287
Epoch 661/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3002
Epoch 662/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3192
Epoch 663/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3300
Epoch 664/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3133
Epoch 665/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3039
Epoch 666/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2982
Epoch 667/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2915
Epoch 668/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2929
Epoch 669/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3197
Epoch 670/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3089
Epoch 671/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3145
Epoch 672/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3342
Epoch 673/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3395
Epoch 674/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3112
```

```
Epoch 675/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3089
Epoch 676/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2862
Epoch 677/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2934
Epoch 678/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2899
Epoch 679/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3003
Epoch 680/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3051
Epoch 681/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3134
Epoch 682/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2988
Epoch 683/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2940
Epoch 684/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3022
Epoch 685/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2996
Epoch 686/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2956
Epoch 687/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3108
Epoch 688/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3063
Epoch 689/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3615
Epoch 690/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3045
Epoch 691/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3007
Epoch 692/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2943
Epoch 693/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2978
Epoch 694/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3045
Epoch 695/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2957
Epoch 696/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2959
Epoch 697/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2968
Epoch 698/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3083
```

```
Epoch 699/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2970
Epoch 700/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3045
Epoch 701/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2951
Epoch 702/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2998
Epoch 703/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2944
Epoch 704/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3042
Epoch 705/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2955
Epoch 706/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2958
Epoch 707/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2976
Epoch 708/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3087
Epoch 709/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3085
Epoch 710/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3190
Epoch 711/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2935
Epoch 712/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3174
Epoch 713/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3109
Epoch 714/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2899
Epoch 715/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2830
Epoch 716/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2960
Epoch 717/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3067
Epoch 718/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3218
Epoch 719/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3385
Epoch 720/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3335
Epoch 721/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3047
Epoch 722/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2957
```

```
Epoch 723/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3044
Epoch 724/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2923
Epoch 725/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3045
Epoch 726/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3025
Epoch 727/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3009
Epoch 728/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3046
Epoch 729/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2987
Epoch 730/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3003
Epoch 731/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3019
Epoch 732/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2880
Epoch 733/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3022
Epoch 734/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3208
Epoch 735/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3123
Epoch 736/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3176
Epoch 737/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3273
Epoch 738/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3049
Epoch 739/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3050
Epoch 740/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3130
Epoch 741/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3245
Epoch 742/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3511
Epoch 743/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2981
Epoch 744/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2957
Epoch 745/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2981
Epoch 746/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2936
```

```
Epoch 747/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2864
Epoch 748/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3008
Epoch 749/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3599
Epoch 750/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3435
Epoch 751/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3091
Epoch 752/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3558
Epoch 753/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3366
Epoch 754/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2889
Epoch 755/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3006
Epoch 756/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3145
Epoch 757/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3105
Epoch 758/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3002
Epoch 759/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2846
Epoch 760/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3078
Epoch 761/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3121
Epoch 762/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2981
Epoch 763/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2834
Epoch 764/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3100
Epoch 765/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2970
Epoch 766/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3009
Epoch 767/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2938
Epoch 768/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3139
Epoch 769/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2899
Epoch 770/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2825
```

```
Epoch 771/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2937
Epoch 772/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2948
Epoch 773/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3288
Epoch 774/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3042
Epoch 775/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3027
Epoch 776/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3461
Epoch 777/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3248
Epoch 778/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2962
Epoch 779/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3004
Epoch 780/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3098
Epoch 781/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2900
Epoch 782/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2843
Epoch 783/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2883
Epoch 784/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2918
Epoch 785/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2853
Epoch 786/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2971
Epoch 787/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2940
Epoch 788/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3046
Epoch 789/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3025
Epoch 790/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2957
Epoch 791/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3428
Epoch 792/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3225
Epoch 793/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3232
Epoch 794/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3264
```

```
Epoch 795/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2912
Epoch 796/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3264
Epoch 797/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2908
Epoch 798/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3391
Epoch 799/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3217
Epoch 800/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2843
Epoch 801/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2797
Epoch 802/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2839
Epoch 803/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2877
Epoch 804/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2821
Epoch 805/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2999
Epoch 806/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3031
Epoch 807/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2934
Epoch 808/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3543
Epoch 809/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3538
Epoch 810/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3074
Epoch 811/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3039
Epoch 812/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2831
Epoch 813/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2890
Epoch 814/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2991
Epoch 815/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2894
Epoch 816/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2962
Epoch 817/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3112
Epoch 818/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3029
```

```
Epoch 819/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3103
Epoch 820/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3399
Epoch 821/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3342
Epoch 822/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3019
Epoch 823/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2950
Epoch 824/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2926
Epoch 825/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3002
Epoch 826/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2912
Epoch 827/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2837
Epoch 828/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3008
Epoch 829/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3228
Epoch 830/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3516
Epoch 831/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3185
Epoch 832/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3020
Epoch 833/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2999
Epoch 834/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2981
Epoch 835/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2876
Epoch 836/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2885
Epoch 837/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2931
Epoch 838/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3015
Epoch 839/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2924
Epoch 840/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3144
Epoch 841/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2857
Epoch 842/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3091
```

```
Epoch 843/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2989
Epoch 844/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2895
Epoch 845/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2857
Epoch 846/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2840
Epoch 847/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3037
Epoch 848/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3005
Epoch 849/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2726
Epoch 850/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2887
Epoch 851/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2878
Epoch 852/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3102
Epoch 853/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3152
Epoch 854/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2965
Epoch 855/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2880
Epoch 856/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2866
Epoch 857/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3041
Epoch 858/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3138
Epoch 859/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3153
Epoch 860/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2968
Epoch 861/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3007
Epoch 862/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2812
Epoch 863/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2802
Epoch 864/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3240
Epoch 865/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3275
Epoch 866/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3517
```

```
Epoch 867/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2986
Epoch 868/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3207
Epoch 869/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3152
Epoch 870/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3251
Epoch 871/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2918
Epoch 872/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2823
Epoch 873/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2778
Epoch 874/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2865
Epoch 875/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2906
Epoch 876/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2993
Epoch 877/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3067
Epoch 878/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3285
Epoch 879/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3180
Epoch 880/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3107
Epoch 881/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3246
Epoch 882/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3173
Epoch 883/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3372
Epoch 884/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2983
Epoch 885/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3149
Epoch 886/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2987
Epoch 887/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2804
Epoch 888/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2996
Epoch 889/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3048
Epoch 890/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3328
```

```
Epoch 891/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2987
Epoch 892/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2931
Epoch 893/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3163
Epoch 894/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3098
Epoch 895/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3227
Epoch 896/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3095
Epoch 897/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3019
Epoch 898/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3168
Epoch 899/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3623
Epoch 900/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3255
Epoch 901/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2925
Epoch 902/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3025
Epoch 903/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2911
Epoch 904/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2834
Epoch 905/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2863
Epoch 906/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2999
Epoch 907/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3020
Epoch 908/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2855
Epoch 909/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3085
Epoch 910/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2975
Epoch 911/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2906
Epoch 912/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2871
Epoch 913/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2801
Epoch 914/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3079
```

```
Epoch 915/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2924
Epoch 916/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2985
Epoch 917/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2970
Epoch 918/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2881
Epoch 919/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3222
Epoch 920/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3140
Epoch 921/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3104
Epoch 922/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3201
Epoch 923/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2898
Epoch 924/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3058
Epoch 925/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2919
Epoch 926/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2899
Epoch 927/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3058
Epoch 928/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2935
Epoch 929/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3047
Epoch 930/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3171
Epoch 931/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3025
Epoch 932/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2939
Epoch 933/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2956
Epoch 934/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3315
Epoch 935/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2986
Epoch 936/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2862
Epoch 937/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2846
Epoch 938/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3029
```

```
Epoch 939/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2871
Epoch 940/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.2850
Epoch 941/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2796
Epoch 942/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2750
Epoch 943/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2966
Epoch 944/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3175
Epoch 945/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3066
Epoch 946/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2863
Epoch 947/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2902
Epoch 948/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2894
Epoch 949/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2828
Epoch 950/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2810
Epoch 951/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2752
Epoch 952/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3170
Epoch 953/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2976
Epoch 954/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3142
Epoch 955/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2829
Epoch 956/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2975
Epoch 957/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2854
Epoch 958/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3012
Epoch 959/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2825
Epoch 960/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2819
Epoch 961/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2868
Epoch 962/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2812
```

```
Epoch 963/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3016
Epoch 964/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2868
Epoch 965/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2820
Epoch 966/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2972
Epoch 967/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2907
Epoch 968/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3021
Epoch 969/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3137
Epoch 970/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3155
Epoch 971/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2873
Epoch 972/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2852
Epoch 973/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2840
Epoch 974/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2773
Epoch 975/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.2972
Epoch 976/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2983
Epoch 977/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2940
Epoch 978/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2763
Epoch 979/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2868
Epoch 980/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2935
Epoch 981/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2774
Epoch 982/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2858
Epoch 983/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2777
Epoch 984/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2900
Epoch 985/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2970
Epoch 986/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2934
```

```
Epoch 987/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2745
Epoch 988/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2856
Epoch 989/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2904
Epoch 990/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2982
Epoch 991/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.2944
Epoch 992/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3181
Epoch 993/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2999
Epoch 994/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.2952
Epoch 995/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3374
Epoch 996/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3398
Epoch 997/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3361
Epoch 998/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3069
Epoch 999/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3320
Epoch 1000/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3030
Finished lambda = 0.05
Epoch 1/1000
13/13 [==============================] - 0s 1ms/step - loss: 4.3818
Epoch 2/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.6833
Epoch 3/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.3267
Epoch 4/1000
13/13 [==============================] - 0s 2ms/step - loss: 1.0731
Epoch 5/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.9907
Epoch 6/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.9480
Epoch 7/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.9363
Epoch 8/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8857
Epoch 9/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8156
Epoch 10/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.7781
Epoch 11/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.7658
Epoch 12/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7665
Epoch 13/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7486
Epoch 14/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7418
Epoch 15/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.7066
Epoch 16/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7251
Epoch 17/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7118
Epoch 18/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7096
Epoch 19/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6862
Epoch 20/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6676
Epoch 21/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6589
Epoch 22/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6815
Epoch 23/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6695
Epoch 24/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6469
Epoch 25/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6573
Epoch 26/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7559
Epoch 27/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6332
Epoch 28/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6171
Epoch 29/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6046
Epoch 30/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6245
Epoch 31/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6138
Epoch 32/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.6378
Epoch 33/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6188
Epoch 34/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.6609
Epoch 35/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6587
Epoch 36/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.6282
Epoch 37/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5878
Epoch 38/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5705
Epoch 39/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5768
Epoch 40/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5739
Epoch 41/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5892
Epoch 42/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5575
Epoch 43/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5815
Epoch 44/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5930
Epoch 45/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5921
Epoch 46/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5793
Epoch 47/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5428
Epoch 48/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5718
Epoch 49/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5572
Epoch 50/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5398
Epoch 51/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5474
Epoch 52/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5298
Epoch 53/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5358
Epoch 54/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5206
Epoch 55/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5577
Epoch 56/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5117
Epoch 57/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5207
Epoch 58/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.5135
Epoch 59/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5387
Epoch 60/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5452
Epoch 61/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5715
Epoch 62/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5423
Epoch 63/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5137
Epoch 64/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5286
Epoch 65/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5152
Epoch 66/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5087
Epoch 67/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5046
Epoch 68/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5054
Epoch 69/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5075
Epoch 70/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4994
Epoch 71/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4990
Epoch 72/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4936
Epoch 73/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4913
Epoch 74/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5040
Epoch 75/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4984
Epoch 76/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4991
Epoch 77/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5025
Epoch 78/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5214
Epoch 79/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5492
Epoch 80/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5199
Epoch 81/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5427
Epoch 82/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4969
Epoch 83/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4850
Epoch 84/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4701
Epoch 85/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4800
Epoch 86/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4764
Epoch 87/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5024
Epoch 88/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4932
Epoch 89/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4790
Epoch 90/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4675
Epoch 91/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4867
Epoch 92/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4786
Epoch 93/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4648
Epoch 94/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4594
Epoch 95/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4748
Epoch 96/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4565
Epoch 97/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4674
Epoch 98/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4644
Epoch 99/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4918
Epoch 100/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4890
Epoch 101/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4837
Epoch 102/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4679
Epoch 103/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4682
Epoch 104/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4611
Epoch 105/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5015
Epoch 106/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4530
Epoch 107/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4619
Epoch 108/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4723
Epoch 109/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4631
Epoch 110/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4550
Epoch 111/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4570
Epoch 112/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4484
Epoch 113/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4437
Epoch 114/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4412
Epoch 115/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4397
Epoch 116/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4498
Epoch 117/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4729
Epoch 118/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4633
Epoch 119/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4572
Epoch 120/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4637
Epoch 121/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4878
Epoch 122/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4727
Epoch 123/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4443
Epoch 124/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4451
Epoch 125/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4334
Epoch 126/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4442
Epoch 127/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4486
Epoch 128/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4340
Epoch 129/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4457
Epoch 130/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4411
Epoch 131/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4718
Epoch 132/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4376
Epoch 133/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4273
Epoch 134/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4512
Epoch 135/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4458
Epoch 136/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4567
Epoch 137/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4315
Epoch 138/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4510
Epoch 139/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4523
Epoch 140/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4632
Epoch 141/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4445
Epoch 142/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4293
Epoch 143/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4443
Epoch 144/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4528
Epoch 145/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4282
Epoch 146/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4272
Epoch 147/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4712
Epoch 148/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4470
Epoch 149/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4293
Epoch 150/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4223
Epoch 151/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4212
Epoch 152/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4222
Epoch 153/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4386
Epoch 154/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4262
Epoch 155/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4304
Epoch 156/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4284
Epoch 157/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4283
Epoch 158/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4284
Epoch 159/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4102
Epoch 160/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4304
Epoch 161/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4475
Epoch 162/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4396
Epoch 163/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4155
Epoch 164/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4343
Epoch 165/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4685
Epoch 166/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4743
Epoch 167/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4786
Epoch 168/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4517
Epoch 169/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4378
Epoch 170/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4403
Epoch 171/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4281
Epoch 172/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4228
Epoch 173/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4366
Epoch 174/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4419
Epoch 175/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4219
Epoch 176/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4462
Epoch 177/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4348
Epoch 178/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4284
Epoch 179/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4334
Epoch 180/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4211
Epoch 181/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4400
Epoch 182/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4298
Epoch 183/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4150
Epoch 184/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4077
Epoch 185/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4090
Epoch 186/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4143
Epoch 187/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4180
Epoch 188/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4205
Epoch 189/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4023
Epoch 190/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4018
Epoch 191/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4158
Epoch 192/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4258
Epoch 193/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4130
Epoch 194/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4186
Epoch 195/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4047
Epoch 196/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3990
Epoch 197/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4228
Epoch 198/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3965
Epoch 199/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4067
Epoch 200/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4085
Epoch 201/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4336
Epoch 202/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3972
Epoch 203/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4041
Epoch 204/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4079
Epoch 205/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4638
Epoch 206/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4349
Epoch 207/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4181
Epoch 208/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4282
Epoch 209/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4402
Epoch 210/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4173
Epoch 211/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4352
Epoch 212/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4110
Epoch 213/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4028
Epoch 214/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4062
Epoch 215/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3995
Epoch 216/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4097
Epoch 217/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3970
Epoch 218/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4177
Epoch 219/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4025
Epoch 220/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4018
Epoch 221/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3892
Epoch 222/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4103
Epoch 223/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4064
Epoch 224/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4411
Epoch 225/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4357
Epoch 226/1000
```

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13/13 [==============================] - 0s 1ms/step - loss: 0.4371
Epoch 227/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4695
Epoch 228/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4047
Epoch 229/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4031
Epoch 230/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4150
Epoch 231/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4023
Epoch 232/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4166
Epoch 233/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3921
Epoch 234/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3898
Epoch 235/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3890
Epoch 236/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3963
Epoch 237/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3975
Epoch 238/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4240
Epoch 239/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4148
Epoch 240/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3973
Epoch 241/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3937
Epoch 242/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3993
Epoch 243/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3967
Epoch 244/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4038
Epoch 245/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4092
Epoch 246/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4170
Epoch 247/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3849
Epoch 248/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3901
Epoch 249/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4000
Epoch 250/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3942
Epoch 251/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4171
Epoch 252/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4092
Epoch 253/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3991
Epoch 254/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4139
Epoch 255/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4082
Epoch 256/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3862
Epoch 257/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4039
Epoch 258/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3929
Epoch 259/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4006
Epoch 260/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3875
Epoch 261/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4031
Epoch 262/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4683
Epoch 263/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4416
Epoch 264/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4051
Epoch 265/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4056
Epoch 266/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4168
Epoch 267/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4283
Epoch 268/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4139
Epoch 269/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3850
Epoch 270/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3776
Epoch 271/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3922
Epoch 272/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3930
Epoch 273/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4171
Epoch 274/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3856
Epoch 275/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3944
Epoch 276/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3852
Epoch 277/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3848
Epoch 278/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3844
Epoch 279/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4071
Epoch 280/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3998
Epoch 281/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3769
Epoch 282/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3799
Epoch 283/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3867
Epoch 284/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3866
Epoch 285/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4087
Epoch 286/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3943
Epoch 287/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3908
Epoch 288/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3862
Epoch 289/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3756
Epoch 290/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3861
Epoch 291/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3891
Epoch 292/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3667
Epoch 293/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3766
Epoch 294/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3952
Epoch 295/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4127
Epoch 296/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3820
Epoch 297/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3886
Epoch 298/1000
```

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13/13 [==============================] - 0s 1ms/step - loss: 0.3947
Epoch 299/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3908
Epoch 300/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4260
Epoch 301/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3924
Epoch 302/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3945
Epoch 303/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3913
Epoch 304/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3748
Epoch 305/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3760
Epoch 306/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3864
Epoch 307/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3908
Epoch 308/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3862
Epoch 309/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3814
Epoch 310/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3687
Epoch 311/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3687
Epoch 312/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3703
Epoch 313/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3827
Epoch 314/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3809
Epoch 315/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3814
Epoch 316/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3744
Epoch 317/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3760
Epoch 318/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3701
Epoch 319/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3733
Epoch 320/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3833
Epoch 321/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3963
Epoch 322/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3963
Epoch 323/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4095
Epoch 324/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4046
Epoch 325/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3951
Epoch 326/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3824
Epoch 327/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3739
Epoch 328/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3923
Epoch 329/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3759
Epoch 330/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3641
Epoch 331/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3680
Epoch 332/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3700
Epoch 333/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4051
Epoch 334/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3900
Epoch 335/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3944
Epoch 336/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3973
Epoch 337/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4070
Epoch 338/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3750
Epoch 339/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3673
Epoch 340/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3872
Epoch 341/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3766
Epoch 342/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3723
Epoch 343/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3673
Epoch 344/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3606
Epoch 345/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3598
Epoch 346/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3622
Epoch 347/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3856
Epoch 348/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4182
Epoch 349/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3769
Epoch 350/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4017
Epoch 351/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3680
Epoch 352/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3890
Epoch 353/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3754
Epoch 354/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3651
Epoch 355/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3694
Epoch 356/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3624
Epoch 357/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3780
Epoch 358/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3945
Epoch 359/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3878
Epoch 360/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3899
Epoch 361/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4105
Epoch 362/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4582
Epoch 363/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4070
Epoch 364/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3699
Epoch 365/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3682
Epoch 366/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3625
Epoch 367/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3679
Epoch 368/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3897
Epoch 369/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3988
Epoch 370/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3720
Epoch 371/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3604
Epoch 372/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3585
Epoch 373/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3769
Epoch 374/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3546
Epoch 375/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3783
Epoch 376/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3752
Epoch 377/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3589
Epoch 378/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3739
Epoch 379/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3793
Epoch 380/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3803
Epoch 381/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4060
Epoch 382/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3681
Epoch 383/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3737
Epoch 384/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3598
Epoch 385/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3663
Epoch 386/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3548
Epoch 387/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3733
Epoch 388/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3716
Epoch 389/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3627
Epoch 390/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3487
Epoch 391/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3634
Epoch 392/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3779
Epoch 393/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3564
Epoch 394/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3581
Epoch 395/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3865
Epoch 396/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3781
Epoch 397/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3888
Epoch 398/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3748
Epoch 399/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3696
Epoch 400/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3682
Epoch 401/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3537
Epoch 402/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3577
Epoch 403/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3564
Epoch 404/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3593
Epoch 405/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3516
Epoch 406/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3570
Epoch 407/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3647
Epoch 408/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3587
Epoch 409/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3787
Epoch 410/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3846
Epoch 411/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3894
Epoch 412/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3757
Epoch 413/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3575
Epoch 414/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3544
Epoch 415/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3712
Epoch 416/1000
13/13 [==============================] - 0s 5ms/step - loss: 0.3780
Epoch 417/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3834
Epoch 418/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3596
Epoch 419/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3664
Epoch 420/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3501
Epoch 421/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3819
Epoch 422/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3949
Epoch 423/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3729
Epoch 424/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3723
Epoch 425/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3629
Epoch 426/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3592
Epoch 427/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3591
Epoch 428/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3646
Epoch 429/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3617
Epoch 430/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3552
Epoch 431/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3467
Epoch 432/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3546
Epoch 433/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3859
Epoch 434/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3999
Epoch 435/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4060
Epoch 436/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3923
Epoch 437/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3745
Epoch 438/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3792
Epoch 439/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3463
Epoch 440/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3438
Epoch 441/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3577
Epoch 442/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3750
Epoch 443/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3666
Epoch 444/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3588
Epoch 445/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3658
Epoch 446/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3522
Epoch 447/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3682
Epoch 448/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3577
Epoch 449/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3494
Epoch 450/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3511
Epoch 451/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3464
Epoch 452/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3608
Epoch 453/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3712
Epoch 454/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3667
Epoch 455/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3665
Epoch 456/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3555
Epoch 457/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3489
Epoch 458/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3788
Epoch 459/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3629
Epoch 460/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3605
Epoch 461/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3618
Epoch 462/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3469
Epoch 463/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3526
Epoch 464/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3660
Epoch 465/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3435
Epoch 466/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3747
Epoch 467/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3676
Epoch 468/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3976
Epoch 469/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3967
Epoch 470/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3440
Epoch 471/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3676
Epoch 472/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4114
Epoch 473/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4012
Epoch 474/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3884
Epoch 475/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3700
Epoch 476/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3609
Epoch 477/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3839
Epoch 478/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3651
Epoch 479/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3499
Epoch 480/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3552
Epoch 481/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3492
Epoch 482/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3707
Epoch 483/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3708
Epoch 484/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3668
Epoch 485/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3713
Epoch 486/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3493
Epoch 487/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3422
Epoch 488/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3490
Epoch 489/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3367
Epoch 490/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3526
Epoch 491/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3671
Epoch 492/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3623
Epoch 493/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3464
Epoch 494/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3493
Epoch 495/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3473
Epoch 496/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3728
Epoch 497/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3925
Epoch 498/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3429
Epoch 499/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3410
Epoch 500/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3588
Epoch 501/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3531
Epoch 502/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3560
Epoch 503/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3794
Epoch 504/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3596
Epoch 505/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3588
Epoch 506/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3719
Epoch 507/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3493
Epoch 508/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3342
Epoch 509/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3468
Epoch 510/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3426
Epoch 511/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3447
Epoch 512/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3572
Epoch 513/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3438
Epoch 514/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3417
Epoch 515/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3476
Epoch 516/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3536
Epoch 517/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3602
Epoch 518/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3600
Epoch 519/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3615
Epoch 520/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3602
Epoch 521/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3425
Epoch 522/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3611
Epoch 523/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3701
Epoch 524/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3372
Epoch 525/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3461
Epoch 526/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3518
Epoch 527/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3366
Epoch 528/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3418
Epoch 529/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3717
Epoch 530/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3589
Epoch 531/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3710
Epoch 532/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3415
Epoch 533/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3336
Epoch 534/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3588
Epoch 535/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3556
Epoch 536/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3378
Epoch 537/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3968
Epoch 538/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3557
Epoch 539/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3544
Epoch 540/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3885
Epoch 541/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3800
Epoch 542/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3745
Epoch 543/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3643
Epoch 544/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3504
Epoch 545/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3475
Epoch 546/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3593
Epoch 547/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3749
Epoch 548/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3630
Epoch 549/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3370
Epoch 550/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3386
Epoch 551/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3394
Epoch 552/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3395
Epoch 553/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3357
Epoch 554/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3471
Epoch 555/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3829
Epoch 556/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3821
Epoch 557/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3660
Epoch 558/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3455
Epoch 559/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3674
Epoch 560/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3462
Epoch 561/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3361
Epoch 562/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3482
Epoch 563/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3494
Epoch 564/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3496
Epoch 565/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3387
Epoch 566/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3521
Epoch 567/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3385
Epoch 568/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3406
Epoch 569/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3433
Epoch 570/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3335
Epoch 571/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3617
Epoch 572/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3443
Epoch 573/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3416
Epoch 574/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3526
Epoch 575/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3370
Epoch 576/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3322
Epoch 577/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3480
Epoch 578/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4143
Epoch 579/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3493
Epoch 580/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3312
Epoch 581/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3583
Epoch 582/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3470
Epoch 583/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3501
Epoch 584/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3704
Epoch 585/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3771
Epoch 586/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3524
Epoch 587/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3451
Epoch 588/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3323
Epoch 589/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3272
Epoch 590/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3307
Epoch 591/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3425
Epoch 592/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3412
Epoch 593/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3367
Epoch 594/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3413
Epoch 595/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4272
Epoch 596/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4031
Epoch 597/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3599
Epoch 598/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3473
Epoch 599/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3397
Epoch 600/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3571
Epoch 601/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3329
Epoch 602/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3372
Epoch 603/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3517
Epoch 604/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3426
Epoch 605/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3557
Epoch 606/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3698
Epoch 607/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3592
Epoch 608/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3457
Epoch 609/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3401
Epoch 610/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.3579
Epoch 611/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3480
Epoch 612/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3584
Epoch 613/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3431
Epoch 614/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3386
Epoch 615/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3462
Epoch 616/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3406
Epoch 617/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3234
Epoch 618/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3666
Epoch 619/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3905
Epoch 620/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3792
Epoch 621/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3499
Epoch 622/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3506
Epoch 623/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3339
Epoch 624/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3266
Epoch 625/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3235
Epoch 626/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3377
Epoch 627/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3526
Epoch 628/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3644
Epoch 629/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3665
Epoch 630/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3643
Epoch 631/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3580
Epoch 632/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3650
Epoch 633/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3649
Epoch 634/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.3430
Epoch 635/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3526
Epoch 636/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3598
Epoch 637/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3512
Epoch 638/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3445
Epoch 639/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3445
Epoch 640/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3431
Epoch 641/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3294
Epoch 642/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3431
Epoch 643/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3590
Epoch 644/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3405
Epoch 645/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3470
Epoch 646/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3458
Epoch 647/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3504
Epoch 648/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3577
Epoch 649/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3509
Epoch 650/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3407
Epoch 651/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3346
Epoch 652/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3255
Epoch 653/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3427
Epoch 654/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3487
Epoch 655/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3370
Epoch 656/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3290
Epoch 657/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3396
Epoch 658/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.3397
Epoch 659/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3437
Epoch 660/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3602
Epoch 661/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3335
Epoch 662/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3310
Epoch 663/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3546
Epoch 664/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3446
Epoch 665/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3383
Epoch 666/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3420
Epoch 667/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3244
Epoch 668/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3214
Epoch 669/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3419
Epoch 670/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3272
Epoch 671/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3389
Epoch 672/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3752
Epoch 673/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3986
Epoch 674/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3959
Epoch 675/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3344
Epoch 676/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3342
Epoch 677/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3275
Epoch 678/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3239
Epoch 679/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3372
Epoch 680/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3329
Epoch 681/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3464
Epoch 682/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3324
Epoch 683/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3308
Epoch 684/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3345
Epoch 685/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3396
Epoch 686/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3393
Epoch 687/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3373
Epoch 688/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3254
Epoch 689/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3936
Epoch 690/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3678
Epoch 691/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3424
Epoch 692/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3462
Epoch 693/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3388
Epoch 694/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3413
Epoch 695/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3331
Epoch 696/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3298
Epoch 697/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3293
Epoch 698/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3415
Epoch 699/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3392
Epoch 700/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3387
Epoch 701/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3316
Epoch 702/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3209
Epoch 703/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3198
Epoch 704/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3448
Epoch 705/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3384
Epoch 706/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3431
Epoch 707/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3416
Epoch 708/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3378
Epoch 709/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3513
Epoch 710/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3481
Epoch 711/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3312
Epoch 712/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3759
Epoch 713/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3535
Epoch 714/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3329
Epoch 715/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3257
Epoch 716/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3310
Epoch 717/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3459
Epoch 718/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3696
Epoch 719/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4027
Epoch 720/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3473
Epoch 721/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3392
Epoch 722/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3264
Epoch 723/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3577
Epoch 724/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3511
Epoch 725/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3742
Epoch 726/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3558
Epoch 727/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3311
Epoch 728/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3416
Epoch 729/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3327
Epoch 730/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3392
Epoch 731/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3409
Epoch 732/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3441
Epoch 733/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3286
Epoch 734/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3408
Epoch 735/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3281
Epoch 736/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3344
Epoch 737/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3351
Epoch 738/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3552
Epoch 739/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3518
Epoch 740/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3398
Epoch 741/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3642
Epoch 742/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3936
Epoch 743/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3476
Epoch 744/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3306
Epoch 745/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3215
Epoch 746/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3225
Epoch 747/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3181
Epoch 748/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3368
Epoch 749/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3707
Epoch 750/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3405
Epoch 751/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3510
Epoch 752/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4010
Epoch 753/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3922
Epoch 754/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3427
Epoch 755/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3329
Epoch 756/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3407
Epoch 757/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3505
Epoch 758/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3532
Epoch 759/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3238
Epoch 760/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3408
Epoch 761/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3569
Epoch 762/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3362
Epoch 763/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3258
Epoch 764/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3463
Epoch 765/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3366
Epoch 766/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3368
Epoch 767/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3302
Epoch 768/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3504
Epoch 769/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3349
Epoch 770/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3195
Epoch 771/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3392
Epoch 772/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3385
Epoch 773/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3724
Epoch 774/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3553
Epoch 775/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3283
Epoch 776/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3809
Epoch 777/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3643
Epoch 778/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3196
Epoch 779/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3256
Epoch 780/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3351
Epoch 781/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3306
Epoch 782/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3180
Epoch 783/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3212
Epoch 784/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3220
Epoch 785/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3204
Epoch 786/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3315
Epoch 787/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3295
Epoch 788/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3255
Epoch 789/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3317
Epoch 790/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3289
Epoch 791/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3695
Epoch 792/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3642
Epoch 793/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3458
Epoch 794/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3504
Epoch 795/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3452
Epoch 796/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3638
Epoch 797/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3182
Epoch 798/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3606
Epoch 799/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3639
Epoch 800/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3380
Epoch 801/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3207
Epoch 802/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.3211
Epoch 803/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3190
Epoch 804/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3198
Epoch 805/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3424
Epoch 806/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3446
Epoch 807/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3256
Epoch 808/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3519
Epoch 809/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3590
Epoch 810/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3361
Epoch 811/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3258
Epoch 812/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3147
Epoch 813/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3243
Epoch 814/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3294
Epoch 815/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3447
Epoch 816/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3470
Epoch 817/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3561
Epoch 818/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3352
Epoch 819/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3211
Epoch 820/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3581
Epoch 821/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3856
Epoch 822/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3392
Epoch 823/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3413
Epoch 824/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3403
Epoch 825/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3508
Epoch 826/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.3330
Epoch 827/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3209
Epoch 828/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3372
Epoch 829/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3663
Epoch 830/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4271
Epoch 831/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3414
Epoch 832/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3454
Epoch 833/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3373
Epoch 834/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3413
Epoch 835/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3151
Epoch 836/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3261
Epoch 837/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3255
Epoch 838/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3372
Epoch 839/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3206
Epoch 840/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3671
Epoch 841/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3364
Epoch 842/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3484
Epoch 843/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3382
Epoch 844/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3249
Epoch 845/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3173
Epoch 846/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3168
Epoch 847/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3376
Epoch 848/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3374
Epoch 849/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3102
Epoch 850/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.3311
Epoch 851/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3324
Epoch 852/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3421
Epoch 853/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3538
Epoch 854/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3361
Epoch 855/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3314
Epoch 856/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3266
Epoch 857/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3325
Epoch 858/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3596
Epoch 859/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3703
Epoch 860/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3410
Epoch 861/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3583
Epoch 862/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3173
Epoch 863/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3128
Epoch 864/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3595
Epoch 865/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3746
Epoch 866/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3448
Epoch 867/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3324
Epoch 868/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3221
Epoch 869/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3259
Epoch 870/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3518
Epoch 871/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3502
Epoch 872/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3308
Epoch 873/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3252
Epoch 874/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3369
Epoch 875/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3288
Epoch 876/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3326
Epoch 877/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3496
Epoch 878/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3591
Epoch 879/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3391
Epoch 880/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3203
Epoch 881/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3483
Epoch 882/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3583
Epoch 883/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4199
Epoch 884/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3403
Epoch 885/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3476
Epoch 886/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3393
Epoch 887/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3329
Epoch 888/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3401
Epoch 889/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3352
Epoch 890/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3756
Epoch 891/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3226
Epoch 892/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3287
Epoch 893/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3324
Epoch 894/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3442
Epoch 895/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3877
Epoch 896/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3498
Epoch 897/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3239
Epoch 898/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3398
Epoch 899/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3520
Epoch 900/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3407
Epoch 901/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3733
Epoch 902/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3786
Epoch 903/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3553
Epoch 904/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3283
Epoch 905/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3257
Epoch 906/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3443
Epoch 907/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3396
Epoch 908/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3518
Epoch 909/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3818
Epoch 910/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3517
Epoch 911/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3209
Epoch 912/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3239
Epoch 913/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3153
Epoch 914/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3464
Epoch 915/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3383
Epoch 916/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3459
Epoch 917/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3375
Epoch 918/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3303
Epoch 919/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3524
Epoch 920/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3599
Epoch 921/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3388
Epoch 922/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3469
Epoch 923/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3260
Epoch 924/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3414
Epoch 925/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3271
Epoch 926/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3185
Epoch 927/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3421
Epoch 928/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3281
Epoch 929/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3429
Epoch 930/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3786
Epoch 931/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4084
Epoch 932/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3646
Epoch 933/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3359
Epoch 934/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3700
Epoch 935/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3342
Epoch 936/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3338
Epoch 937/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3377
Epoch 938/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3529
Epoch 939/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3584
Epoch 940/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3416
Epoch 941/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3160
Epoch 942/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3160
Epoch 943/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3338
Epoch 944/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3416
Epoch 945/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3511
Epoch 946/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3243
Epoch 947/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3321
Epoch 948/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3206
Epoch 949/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3159
Epoch 950/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3080
Epoch 951/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3044
Epoch 952/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3275
Epoch 953/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3315
Epoch 954/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3513
Epoch 955/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3112
Epoch 956/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3282
Epoch 957/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3195
Epoch 958/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3248
Epoch 959/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3153
Epoch 960/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3210
Epoch 961/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3371
Epoch 962/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3212
Epoch 963/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3306
Epoch 964/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3148
Epoch 965/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3131
Epoch 966/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3259
Epoch 967/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3215
Epoch 968/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3254
Epoch 969/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3791
Epoch 970/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3720
Epoch 971/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3353
Epoch 972/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3135
Epoch 973/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3205
Epoch 974/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3144
Epoch 975/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3372
Epoch 976/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3273
Epoch 977/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3326
Epoch 978/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3202
Epoch 979/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3281
Epoch 980/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3304
Epoch 981/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3239
Epoch 982/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3219
Epoch 983/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3082
Epoch 984/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3298
Epoch 985/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3461
Epoch 986/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3448
Epoch 987/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3458
Epoch 988/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3124
Epoch 989/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3262
Epoch 990/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3221
Epoch 991/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3159
Epoch 992/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3454
Epoch 993/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3152
Epoch 994/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.3329
Epoch 995/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3494
Epoch 996/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3437
Epoch 997/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3686
Epoch 998/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3193
Epoch 999/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3471
Epoch 1000/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3561
Finished lambda = 0.1
Epoch 1/1000
13/13 [==============================] - 0s 1ms/step - loss: 7.3305
Epoch 2/1000
13/13 [==============================] - 0s 1ms/step - loss: 2.0539
Epoch 3/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.7673
Epoch 4/1000
13/13 [==============================] - 0s 2ms/step - loss: 1.4216
Epoch 5/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.2743
Epoch 6/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.2351
Epoch 7/1000
13/13 [==============================] - 0s 4ms/step - loss: 1.1670
Epoch 8/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.0987
Epoch 9/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.0284
Epoch 10/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.0016
Epoch 11/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.9683
Epoch 12/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.9504
Epoch 13/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.9524
Epoch 14/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.9500
Epoch 15/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.9075
Epoch 16/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8961
Epoch 17/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8946
```

```
Epoch 18/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8974
Epoch 19/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.8728
Epoch 20/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.8463
Epoch 21/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8204
Epoch 22/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8321
Epoch 23/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.8348
Epoch 24/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7978
Epoch 25/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8064
Epoch 26/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.9342
Epoch 27/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.8211
Epoch 28/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7755
Epoch 29/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7600
Epoch 30/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7868
Epoch 31/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.7830
Epoch 32/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7856
Epoch 33/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7800
Epoch 34/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7882
Epoch 35/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.7801
Epoch 36/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7287
Epoch 37/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7261
Epoch 38/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7039
Epoch 39/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.7075
Epoch 40/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7193
Epoch 41/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7282
```

```
Epoch 42/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6996
Epoch 43/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.7192
Epoch 44/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7187
Epoch 45/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7053
Epoch 46/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6948
Epoch 47/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.6840
Epoch 48/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7291
Epoch 49/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6932
Epoch 50/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6735
Epoch 51/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6735
Epoch 52/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6519
Epoch 53/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6518
Epoch 54/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6390
Epoch 55/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.6783
Epoch 56/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6402
Epoch 57/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6405
Epoch 58/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6299
Epoch 59/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6480
Epoch 60/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6389
Epoch 61/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6844
Epoch 62/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6454
Epoch 63/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6270
Epoch 64/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.6366
Epoch 65/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6236
```

```
Epoch 66/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6371
Epoch 67/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6222
Epoch 68/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.6146
Epoch 69/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6082
Epoch 70/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6147
Epoch 71/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6117
Epoch 72/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6084
Epoch 73/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6030
Epoch 74/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6092
Epoch 75/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.6094
Epoch 76/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6126
Epoch 77/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6040
Epoch 78/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6133
Epoch 79/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6300
Epoch 80/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6068
Epoch 81/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6239
Epoch 82/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6064
Epoch 83/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.5895
Epoch 84/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5818
Epoch 85/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5913
Epoch 86/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5868
Epoch 87/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6109
Epoch 88/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5921
Epoch 89/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5855
```

```
Epoch 90/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5764
Epoch 91/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5730
Epoch 92/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5754
Epoch 93/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5625
Epoch 94/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5611
Epoch 95/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5659
Epoch 96/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5567
Epoch 97/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5676
Epoch 98/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5687
Epoch 99/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.5921
Epoch 100/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5978
Epoch 101/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5910
Epoch 102/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5811
Epoch 103/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5670
Epoch 104/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5651
Epoch 105/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6104
Epoch 106/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5725
Epoch 107/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5625
Epoch 108/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5698
Epoch 109/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5614
Epoch 110/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5551
Epoch 111/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5539
Epoch 112/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5501
Epoch 113/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5429
```

```
Epoch 114/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5430
Epoch 115/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.5422
Epoch 116/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5442
Epoch 117/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5777
Epoch 118/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5710
Epoch 119/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5637
Epoch 120/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5547
Epoch 121/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5517
Epoch 122/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5536
Epoch 123/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5413
Epoch 124/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5441
Epoch 125/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5283
Epoch 126/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5392
Epoch 127/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5473
Epoch 128/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5317
Epoch 129/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5325
Epoch 130/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5271
Epoch 131/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5492
Epoch 132/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5412
Epoch 133/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5121
Epoch 134/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5440
Epoch 135/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5316
Epoch 136/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5315
Epoch 137/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5231
```

```
Epoch 138/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5441
Epoch 139/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5339
Epoch 140/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5477
Epoch 141/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5526
Epoch 142/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5221
Epoch 143/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5245
Epoch 144/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5446
Epoch 145/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5251
Epoch 146/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5246
Epoch 147/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5687
Epoch 148/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5433
Epoch 149/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5319
Epoch 150/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5268
Epoch 151/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5142
Epoch 152/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5240
Epoch 153/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5221
Epoch 154/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5151
Epoch 155/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5228
Epoch 156/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5165
Epoch 157/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5224
Epoch 158/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5168
Epoch 159/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5120
Epoch 160/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5204
Epoch 161/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5412
```

```
Epoch 162/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5509
Epoch 163/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5090
Epoch 164/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5220
Epoch 165/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5446
Epoch 166/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5481
Epoch 167/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5393
Epoch 168/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5321
Epoch 169/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5145
Epoch 170/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5157
Epoch 171/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5067
Epoch 172/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5075
Epoch 173/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5133
Epoch 174/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5121
Epoch 175/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4920
Epoch 176/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5140
Epoch 177/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5133
Epoch 178/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5101
Epoch 179/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5034
Epoch 180/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5260
Epoch 181/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5079
Epoch 182/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4972
Epoch 183/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4897
Epoch 184/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4984
Epoch 185/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5047
```

```
Epoch 186/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5136
Epoch 187/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4977
Epoch 188/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4979
Epoch 189/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4941
Epoch 190/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4839
Epoch 191/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4993
Epoch 192/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5013
Epoch 193/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4866
Epoch 194/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4877
Epoch 195/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4781
Epoch 196/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4782
Epoch 197/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4984
Epoch 198/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4815
Epoch 199/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4885
Epoch 200/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4851
Epoch 201/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5004
Epoch 202/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4760
Epoch 203/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4897
Epoch 204/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4938
Epoch 205/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5428
Epoch 206/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4986
Epoch 207/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5041
Epoch 208/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5060
Epoch 209/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5147
```

```
Epoch 210/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4868
Epoch 211/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4933
Epoch 212/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4781
Epoch 213/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4768
Epoch 214/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4778
Epoch 215/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4822
Epoch 216/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4962
Epoch 217/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4872
Epoch 218/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4994
Epoch 219/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4827
Epoch 220/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4782
Epoch 221/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4634
Epoch 222/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4772
Epoch 223/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4859
Epoch 224/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4898
Epoch 225/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4762
Epoch 226/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5080
Epoch 227/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5122
Epoch 228/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4841
Epoch 229/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4845
Epoch 230/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.5012
Epoch 231/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5028
Epoch 232/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5129
Epoch 233/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4736
```

```
Epoch 234/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4731
Epoch 235/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4769
Epoch 236/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4821
Epoch 237/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4804
Epoch 238/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.5055
Epoch 239/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5058
Epoch 240/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4825
Epoch 241/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4596
Epoch 242/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4687
Epoch 243/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4724
Epoch 244/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4737
Epoch 245/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4775
Epoch 246/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4740
Epoch 247/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4572
Epoch 248/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4732
Epoch 249/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4754
Epoch 250/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4668
Epoch 251/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5030
Epoch 252/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4835
Epoch 253/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4646
Epoch 254/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4846
Epoch 255/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4731
Epoch 256/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4620
Epoch 257/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4765
```

```
Epoch 258/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4625
Epoch 259/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4723
Epoch 260/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4722
Epoch 261/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4673
Epoch 262/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5219
Epoch 263/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4987
Epoch 264/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4643
Epoch 265/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4634
Epoch 266/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4906
Epoch 267/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4997
Epoch 268/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4965
Epoch 269/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4502
Epoch 270/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4541
Epoch 271/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4623
Epoch 272/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4632
Epoch 273/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4831
Epoch 274/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4564
Epoch 275/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4582
Epoch 276/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4576
Epoch 277/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4575
Epoch 278/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4556
Epoch 279/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4813
Epoch 280/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4732
Epoch 281/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4504
```

```
Epoch 282/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4533
Epoch 283/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4590
Epoch 284/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4457
Epoch 285/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4667
Epoch 286/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4691
Epoch 287/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4781
Epoch 288/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4670
Epoch 289/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4534
Epoch 290/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4645
Epoch 291/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4711
Epoch 292/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4496
Epoch 293/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4550
Epoch 294/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4619
Epoch 295/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4962
Epoch 296/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4634
Epoch 297/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4523
Epoch 298/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4710
Epoch 299/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4771
Epoch 300/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4646
Epoch 301/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4555
Epoch 302/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4486
Epoch 303/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4648
Epoch 304/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4790
Epoch 305/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4483
```

```
Epoch 306/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4747
Epoch 307/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4580
Epoch 308/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4517
Epoch 309/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4528
Epoch 310/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4420
Epoch 311/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4358
Epoch 312/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4391
Epoch 313/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4479
Epoch 314/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4500
Epoch 315/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4424
Epoch 316/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4400
Epoch 317/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4350
Epoch 318/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4383
Epoch 319/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4381
Epoch 320/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4483
Epoch 321/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4567
Epoch 322/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4630
Epoch 323/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4733
Epoch 324/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5019
Epoch 325/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4804
Epoch 326/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4697
Epoch 327/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4579
Epoch 328/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4670
Epoch 329/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4432
```

```
Epoch 330/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4404
Epoch 331/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4418
Epoch 332/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4393
Epoch 333/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4917
Epoch 334/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4656
Epoch 335/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4601
Epoch 336/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4738
Epoch 337/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4712
Epoch 338/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4765
Epoch 339/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4381
Epoch 340/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4280
Epoch 341/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4316
Epoch 342/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4287
Epoch 343/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4270
Epoch 344/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4279
Epoch 345/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4243
Epoch 346/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4278
Epoch 347/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4407
Epoch 348/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4658
Epoch 349/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4492
Epoch 350/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4713
Epoch 351/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4324
Epoch 352/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4444
Epoch 353/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4370
```

```
Epoch 354/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4281
Epoch 355/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4370
Epoch 356/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4236
Epoch 357/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4326
Epoch 358/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4509
Epoch 359/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4547
Epoch 360/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4444
Epoch 361/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4543
Epoch 362/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4893
Epoch 363/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4283
Epoch 364/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4384
Epoch 365/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4349
Epoch 366/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4236
Epoch 367/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4330
Epoch 368/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4365
Epoch 369/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4341
Epoch 370/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4451
Epoch 371/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4282
Epoch 372/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4236
Epoch 373/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4346
Epoch 374/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4385
Epoch 375/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4458
Epoch 376/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4615
Epoch 377/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4185
```

```
Epoch 378/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4298
Epoch 379/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4391
Epoch 380/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4252
Epoch 381/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4946
Epoch 382/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4597
Epoch 383/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4478
Epoch 384/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4298
Epoch 385/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4357
Epoch 386/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4203
Epoch 387/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4379
Epoch 388/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4361
Epoch 389/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4287
Epoch 390/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4158
Epoch 391/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4257
Epoch 392/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4339
Epoch 393/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4222
Epoch 394/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4364
Epoch 395/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4726
Epoch 396/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4845
Epoch 397/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4799
Epoch 398/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4498
Epoch 399/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4580
Epoch 400/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4503
Epoch 401/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4217
```

```
Epoch 402/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4205
Epoch 403/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4301
Epoch 404/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4372
Epoch 405/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4209
Epoch 406/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4182
Epoch 407/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4315
Epoch 408/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4433
Epoch 409/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4187
Epoch 410/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4314
Epoch 411/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4556
Epoch 412/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4186
Epoch 413/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4261
Epoch 414/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4419
Epoch 415/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4578
Epoch 416/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4202
Epoch 417/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4398
Epoch 418/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4282
Epoch 419/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4175
Epoch 420/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4094
Epoch 421/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4332
Epoch 422/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4391
Epoch 423/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4282
Epoch 424/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4122
Epoch 425/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4146
```

```
Epoch 426/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4176
Epoch 427/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4376
Epoch 428/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4367
Epoch 429/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4254
Epoch 430/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4266
Epoch 431/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4066
Epoch 432/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4151
Epoch 433/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4197
Epoch 434/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4438
Epoch 435/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4443
Epoch 436/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4279
Epoch 437/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4354
Epoch 438/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4298
Epoch 439/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4068
Epoch 440/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4072
Epoch 441/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4171
Epoch 442/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4339
Epoch 443/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4308
Epoch 444/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4424
Epoch 445/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4486
Epoch 446/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4689
Epoch 447/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4488
Epoch 448/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4233
Epoch 449/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4066
```

```
Epoch 450/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4106
Epoch 451/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4080
Epoch 452/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4176
Epoch 453/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4377
Epoch 454/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4549
Epoch 455/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4589
Epoch 456/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4453
Epoch 457/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4091
Epoch 458/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4247
Epoch 459/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4114
Epoch 460/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4077
Epoch 461/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4066
Epoch 462/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3998
Epoch 463/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4065
Epoch 464/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4224
Epoch 465/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4093
Epoch 466/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4367
Epoch 467/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4290
Epoch 468/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4419
Epoch 469/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4647
Epoch 470/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4229
Epoch 471/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4145
Epoch 472/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4521
Epoch 473/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4735
```

```
Epoch 474/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4743
Epoch 475/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4284
Epoch 476/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4034
Epoch 477/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4337
Epoch 478/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4107
Epoch 479/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4605
Epoch 480/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4719
Epoch 481/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4435
Epoch 482/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4305
Epoch 483/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4702
Epoch 484/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4382
Epoch 485/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4635
Epoch 486/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4194
Epoch 487/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4035
Epoch 488/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4070
Epoch 489/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3948
Epoch 490/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4074
Epoch 491/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4177
Epoch 492/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4315
Epoch 493/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4128
Epoch 494/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3983
Epoch 495/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4084
Epoch 496/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4207
Epoch 497/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4822
```

```
Epoch 498/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4362
Epoch 499/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3974
Epoch 500/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4184
Epoch 501/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4050
Epoch 502/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4194
Epoch 503/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4447
Epoch 504/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4713
Epoch 505/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4511
Epoch 506/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4484
Epoch 507/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4303
Epoch 508/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4030
Epoch 509/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4085
Epoch 510/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4034
Epoch 511/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4171
Epoch 512/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4094
Epoch 513/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4106
Epoch 514/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4130
Epoch 515/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4106
Epoch 516/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4075
Epoch 517/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4169
Epoch 518/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4110
Epoch 519/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4151
Epoch 520/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4168
Epoch 521/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4337
```

```
Epoch 522/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4078
Epoch 523/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4504
Epoch 524/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4166
Epoch 525/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4297
Epoch 526/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4195
Epoch 527/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3891
Epoch 528/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3932
Epoch 529/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4283
Epoch 530/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4208
Epoch 531/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4168
Epoch 532/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4060
Epoch 533/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3915
Epoch 534/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4155
Epoch 535/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4210
Epoch 536/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3900
Epoch 537/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4409
Epoch 538/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4066
Epoch 539/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3981
Epoch 540/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4260
Epoch 541/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4895
Epoch 542/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4213
Epoch 543/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4211
Epoch 544/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4390
Epoch 545/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4002
```

```
Epoch 546/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3999
Epoch 547/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4273
Epoch 548/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4036
Epoch 549/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3978
Epoch 550/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3958
Epoch 551/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4007
Epoch 552/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4029
Epoch 553/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3997
Epoch 554/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4019
Epoch 555/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4425
Epoch 556/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4326
Epoch 557/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4539
Epoch 558/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4324
Epoch 559/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4510
Epoch 560/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4201
Epoch 561/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4035
Epoch 562/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4204
Epoch 563/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3995
Epoch 564/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4233
Epoch 565/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4073
Epoch 566/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4120
Epoch 567/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4113
Epoch 568/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4200
Epoch 569/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4056
```

```
Epoch 570/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4390
Epoch 571/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4195
Epoch 572/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4159
Epoch 573/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4151
Epoch 574/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4285
Epoch 575/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4161
Epoch 576/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4002
Epoch 577/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4012
Epoch 578/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4826
Epoch 579/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4323
Epoch 580/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3979
Epoch 581/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4081
Epoch 582/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4111
Epoch 583/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4020
Epoch 584/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4224
Epoch 585/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4452
Epoch 586/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4275
Epoch 587/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4059
Epoch 588/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3806
Epoch 589/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3815
Epoch 590/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3795
Epoch 591/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3950
Epoch 592/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3908
Epoch 593/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3986
```

```
Epoch 594/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3971
Epoch 595/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4547
Epoch 596/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4217
Epoch 597/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3903
Epoch 598/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3899
Epoch 599/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3899
Epoch 600/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4048
Epoch 601/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3811
Epoch 602/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3963
Epoch 603/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3960
Epoch 604/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4078
Epoch 605/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4062
Epoch 606/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4323
Epoch 607/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4111
Epoch 608/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4204
Epoch 609/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4018
Epoch 610/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4288
Epoch 611/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4345
Epoch 612/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4396
Epoch 613/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4220
Epoch 614/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4076
Epoch 615/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4151
Epoch 616/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4375
Epoch 617/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4107
```

```
Epoch 618/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4320
Epoch 619/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5052
Epoch 620/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4725
Epoch 621/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3986
Epoch 622/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3926
Epoch 623/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3904
Epoch 624/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3843
Epoch 625/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3796
Epoch 626/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3971
Epoch 627/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3997
Epoch 628/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4224
Epoch 629/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4081
Epoch 630/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4002
Epoch 631/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3999
Epoch 632/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4189
Epoch 633/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4124
Epoch 634/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4116
Epoch 635/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4069
Epoch 636/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4228
Epoch 637/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4017
Epoch 638/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3951
Epoch 639/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3887
Epoch 640/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4111
Epoch 641/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3916
```

```
Epoch 642/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4167
Epoch 643/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4325
Epoch 644/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3954
Epoch 645/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4429
Epoch 646/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4494
Epoch 647/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3927
Epoch 648/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3984
Epoch 649/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3853
Epoch 650/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3866
Epoch 651/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3837
Epoch 652/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3766
Epoch 653/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3934
Epoch 654/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4094
Epoch 655/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4130
Epoch 656/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4033
Epoch 657/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3898
Epoch 658/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3824
Epoch 659/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3789
Epoch 660/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4124
Epoch 661/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3841
Epoch 662/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3863
Epoch 663/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4046
Epoch 664/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4014
Epoch 665/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3959
```

```
Epoch 666/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4139
Epoch 667/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3785
Epoch 668/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3723
Epoch 669/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3906
Epoch 670/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3916
Epoch 671/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3856
Epoch 672/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3960
Epoch 673/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3896
Epoch 674/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4161
Epoch 675/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3998
Epoch 676/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3994
Epoch 677/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3928
Epoch 678/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3879
Epoch 679/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3903
Epoch 680/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3870
Epoch 681/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4057
Epoch 682/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3845
Epoch 683/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3840
Epoch 684/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3963
Epoch 685/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3952
Epoch 686/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3890
Epoch 687/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3848
Epoch 688/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3721
Epoch 689/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4237
```

```
Epoch 690/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4118
Epoch 691/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4134
Epoch 692/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3938
Epoch 693/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3770
Epoch 694/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3862
Epoch 695/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3836
Epoch 696/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3806
Epoch 697/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3900
Epoch 698/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4123
Epoch 699/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3941
Epoch 700/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3848
Epoch 701/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3979
Epoch 702/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3843
Epoch 703/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3733
Epoch 704/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4032
Epoch 705/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3955
Epoch 706/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3935
Epoch 707/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4077
Epoch 708/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4006
Epoch 709/1000
13/13 [==============================] - 0s 5ms/step - loss: 0.4320
Epoch 710/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4190
Epoch 711/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4116
Epoch 712/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4650
Epoch 713/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4132
```

```
Epoch 714/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4076
Epoch 715/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3789
Epoch 716/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3663
Epoch 717/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3898
Epoch 718/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3906
Epoch 719/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4335
Epoch 720/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4034
Epoch 721/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3927
Epoch 722/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3845
Epoch 723/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4026
Epoch 724/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3912
Epoch 725/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4131
Epoch 726/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4280
Epoch 727/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4130
Epoch 728/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4061
Epoch 729/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3721
Epoch 730/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3998
Epoch 731/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3981
Epoch 732/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3849
Epoch 733/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3849
Epoch 734/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4087
Epoch 735/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3814
Epoch 736/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3776
Epoch 737/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3797
```

```
Epoch 738/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4134
Epoch 739/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4088
Epoch 740/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3967
Epoch 741/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4052
Epoch 742/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4144
Epoch 743/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3789
Epoch 744/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4080
Epoch 745/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3896
Epoch 746/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3958
Epoch 747/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3870
Epoch 748/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4056
Epoch 749/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4596
Epoch 750/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4262
Epoch 751/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4073
Epoch 752/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4913
Epoch 753/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4641
Epoch 754/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3999
Epoch 755/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3859
Epoch 756/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4016
Epoch 757/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4226
Epoch 758/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4450
Epoch 759/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4368
Epoch 760/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4685
Epoch 761/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4577
```

```
Epoch 762/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4308
Epoch 763/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4102
Epoch 764/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4147
Epoch 765/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3958
Epoch 766/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3872
Epoch 767/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3981
Epoch 768/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3820
Epoch 769/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3836
Epoch 770/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3768
Epoch 771/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3814
Epoch 772/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3839
Epoch 773/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4017
Epoch 774/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4031
Epoch 775/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3889
Epoch 776/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3958
Epoch 777/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4190
Epoch 778/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4150
Epoch 779/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3904
Epoch 780/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3780
Epoch 781/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4091
Epoch 782/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4240
Epoch 783/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3895
Epoch 784/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3774
Epoch 785/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3770
```

```
Epoch 786/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3863
Epoch 787/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3959
Epoch 788/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3721
Epoch 789/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3909
Epoch 790/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4157
Epoch 791/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4174
Epoch 792/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4304
Epoch 793/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4052
Epoch 794/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4161
Epoch 795/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3819
Epoch 796/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4294
Epoch 797/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3900
Epoch 798/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4082
Epoch 799/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3857
Epoch 800/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3871
Epoch 801/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3892
Epoch 802/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3772
Epoch 803/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3703
Epoch 804/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3647
Epoch 805/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3843
Epoch 806/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3837
Epoch 807/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3825
Epoch 808/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3951
Epoch 809/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4260
```

```
Epoch 810/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3754
Epoch 811/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3664
Epoch 812/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3676
Epoch 813/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3713
Epoch 814/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3711
Epoch 815/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3957
Epoch 816/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3966
Epoch 817/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3852
Epoch 818/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3811
Epoch 819/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3834
Epoch 820/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4293
Epoch 821/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4380
Epoch 822/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4316
Epoch 823/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3825
Epoch 824/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3768
Epoch 825/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3765
Epoch 826/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3758
Epoch 827/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3657
Epoch 828/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3794
Epoch 829/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3976
Epoch 830/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4414
Epoch 831/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4030
Epoch 832/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4150
Epoch 833/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3878
```

```
Epoch 834/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3977
Epoch 835/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3742
Epoch 836/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3744
Epoch 837/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3722
Epoch 838/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3850
Epoch 839/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3773
Epoch 840/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4259
Epoch 841/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4538
Epoch 842/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3840
Epoch 843/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3947
Epoch 844/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3850
Epoch 845/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3711
Epoch 846/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3735
Epoch 847/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3867
Epoch 848/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3782
Epoch 849/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3907
Epoch 850/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3997
Epoch 851/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3921
Epoch 852/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3911
Epoch 853/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3954
Epoch 854/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3818
Epoch 855/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3723
Epoch 856/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3775
Epoch 857/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3798
```

```
Epoch 858/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3882
Epoch 859/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4555
Epoch 860/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3883
Epoch 861/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4177
Epoch 862/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3927
Epoch 863/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3764
Epoch 864/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4406
Epoch 865/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4551
Epoch 866/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4149
Epoch 867/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3941
Epoch 868/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3828
Epoch 869/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3786
Epoch 870/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.3908
Epoch 871/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4018
Epoch 872/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3756
Epoch 873/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3608
Epoch 874/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3666
Epoch 875/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3735
Epoch 876/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3825
Epoch 877/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3949
Epoch 878/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3843
Epoch 879/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3764
Epoch 880/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3726
Epoch 881/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4077
```

```
Epoch 882/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4082
Epoch 883/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4647
Epoch 884/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4117
Epoch 885/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4137
Epoch 886/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3766
Epoch 887/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3847
Epoch 888/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3827
Epoch 889/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3771
Epoch 890/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3975
Epoch 891/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3751
Epoch 892/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3799
Epoch 893/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3984
Epoch 894/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3896
Epoch 895/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4349
Epoch 896/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4009
Epoch 897/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3860
Epoch 898/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4113
Epoch 899/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4130
Epoch 900/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3933
Epoch 901/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4191
Epoch 902/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4013
Epoch 903/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3950
Epoch 904/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3678
Epoch 905/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4050
```

```
Epoch 906/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4526
Epoch 907/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3866
Epoch 908/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3975
Epoch 909/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4462
Epoch 910/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4072
Epoch 911/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3860
Epoch 912/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3820
Epoch 913/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3682
Epoch 914/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3963
Epoch 915/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3815
Epoch 916/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3777
Epoch 917/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3747
Epoch 918/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3570
Epoch 919/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3813
Epoch 920/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4254
Epoch 921/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3919
Epoch 922/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3914
Epoch 923/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3805
Epoch 924/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3982
Epoch 925/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3714
Epoch 926/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3732
Epoch 927/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3935
Epoch 928/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3674
Epoch 929/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3576
```

```
Epoch 930/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4063
Epoch 931/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4157
Epoch 932/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4325
Epoch 933/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4214
Epoch 934/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4030
Epoch 935/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3826
Epoch 936/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3694
Epoch 937/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3678
Epoch 938/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3851
Epoch 939/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3942
Epoch 940/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3825
Epoch 941/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3634
Epoch 942/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3627
Epoch 943/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3759
Epoch 944/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3871
Epoch 945/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3658
Epoch 946/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3667
Epoch 947/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3887
Epoch 948/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3801
Epoch 949/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3629
Epoch 950/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3577
Epoch 951/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3543
Epoch 952/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3914
Epoch 953/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3981
```

```
Epoch 954/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3952
Epoch 955/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3657
Epoch 956/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3856
Epoch 957/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4042
Epoch 958/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3691
Epoch 959/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3640
Epoch 960/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3759
Epoch 961/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3745
Epoch 962/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3580
Epoch 963/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3831
Epoch 964/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3613
Epoch 965/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3675
Epoch 966/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3850
Epoch 967/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3864
Epoch 968/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4015
Epoch 969/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4358
Epoch 970/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4257
Epoch 971/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4130
Epoch 972/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3814
Epoch 973/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3711
Epoch 974/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3753
Epoch 975/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3828
Epoch 976/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3680
Epoch 977/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3746
```

```
Epoch 978/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3636
Epoch 979/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3878
Epoch 980/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3988
Epoch 981/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3750
Epoch 982/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3679
Epoch 983/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3571
Epoch 984/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3819
Epoch 985/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3704
Epoch 986/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3774
Epoch 987/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3835
Epoch 988/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3590
Epoch 989/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3715
Epoch 990/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3605
Epoch 991/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3784
Epoch 992/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3695
Epoch 993/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.3768
Epoch 994/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3748
Epoch 995/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3912
Epoch 996/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3966
Epoch 997/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4233
Epoch 998/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3610
Epoch 999/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3804
Epoch 1000/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3814
Finished lambda = 0.2
Epoch 1/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 9.8240
Epoch 2/1000
13/13 [==============================] - 0s 1ms/step - loss: 2.2941
Epoch 3/1000
13/13 [==============================] - 0s 2ms/step - loss: 2.0224
Epoch 4/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.6617
Epoch 5/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.5529
Epoch 6/1000
13/13 [==============================] - 0s 4ms/step - loss: 1.5145
Epoch 7/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.4504
Epoch 8/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.4126
Epoch 9/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.3823
Epoch 10/1000
13/13 [==============================] - 0s 3ms/step - loss: 1.3487
Epoch 11/1000
13/13 [==============================] - 0s 2ms/step - loss: 1.2859
Epoch 12/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.2361
Epoch 13/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.2227
Epoch 14/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.1711
Epoch 15/1000
13/13 [==============================] - 0s 2ms/step - loss: 1.1076
Epoch 16/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.0964
Epoch 17/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.1096
Epoch 18/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.0697
Epoch 19/1000
13/13 [==============================] - 0s 3ms/step - loss: 1.0372
Epoch 20/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.0143
Epoch 21/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.9934
Epoch 22/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.9875
Epoch 23/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.9718
Epoch 24/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.9638
Epoch 25/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.9312
Epoch 26/1000
13/13 [==============================] - 0s 1ms/step - loss: 1.0507
Epoch 27/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.9802
Epoch 28/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.9319
Epoch 29/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8973
Epoch 30/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.9171
Epoch 31/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.9031
Epoch 32/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.9235
Epoch 33/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.8815
Epoch 34/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8816
Epoch 35/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8773
Epoch 36/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.8623
Epoch 37/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.8511
Epoch 38/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8529
Epoch 39/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8421
Epoch 40/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8842
Epoch 41/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.8582
Epoch 42/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8142
Epoch 43/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8262
Epoch 44/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8449
Epoch 45/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.8335
Epoch 46/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8717
Epoch 47/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8457
Epoch 48/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8543
Epoch 49/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.8180
Epoch 50/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.7972
Epoch 51/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7949
Epoch 52/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7942
Epoch 53/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7766
Epoch 54/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.7629
Epoch 55/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8018
Epoch 56/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7752
Epoch 57/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7784
Epoch 58/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.7531
Epoch 59/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7732
Epoch 60/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7617
Epoch 61/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.8013
Epoch 62/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.7902
Epoch 63/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.7824
Epoch 64/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7560
Epoch 65/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7429
Epoch 66/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7496
Epoch 67/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.7481
Epoch 68/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7445
Epoch 69/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7267
Epoch 70/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7464
Epoch 71/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.7317
Epoch 72/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7238
Epoch 73/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.7240
Epoch 74/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7393
Epoch 75/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.7151
Epoch 76/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.7296
Epoch 77/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7194
Epoch 78/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7079
Epoch 79/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.7165
Epoch 80/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7136
Epoch 81/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7057
Epoch 82/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7064
Epoch 83/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6878
Epoch 84/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.6923
Epoch 85/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6891
Epoch 86/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6944
Epoch 87/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6866
Epoch 88/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.7030
Epoch 89/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6948
Epoch 90/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6955
Epoch 91/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6906
Epoch 92/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6777
Epoch 93/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6840
Epoch 94/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6716
Epoch 95/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6764
Epoch 96/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6624
Epoch 97/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.6602
Epoch 98/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6746
Epoch 99/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6932
Epoch 100/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7013
Epoch 101/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6920
Epoch 102/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6594
Epoch 103/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6660
Epoch 104/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6576
Epoch 105/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.7019
Epoch 106/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.7179
Epoch 107/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6857
Epoch 108/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6916
Epoch 109/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.6818
Epoch 110/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6770
Epoch 111/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6666
Epoch 112/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6476
Epoch 113/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6423
Epoch 114/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.6374
Epoch 115/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6376
Epoch 116/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6437
Epoch 117/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6676
Epoch 118/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6745
Epoch 119/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6791
Epoch 120/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6592
Epoch 121/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.6358
Epoch 122/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6411
Epoch 123/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6409
Epoch 124/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6411
Epoch 125/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6261
Epoch 126/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6329
Epoch 127/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.6430
Epoch 128/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6203
Epoch 129/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6177
Epoch 130/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6144
Epoch 131/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6298
Epoch 132/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6359
Epoch 133/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6049
Epoch 134/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6333
Epoch 135/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6214
Epoch 136/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6172
Epoch 137/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6090
Epoch 138/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6361
Epoch 139/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6228
Epoch 140/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.6284
Epoch 141/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6560
Epoch 142/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6105
Epoch 143/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6082
Epoch 144/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.6236
Epoch 145/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.6155
Epoch 146/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6151
Epoch 147/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6563
Epoch 148/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6250
Epoch 149/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6206
Epoch 150/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6107
Epoch 151/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5987
Epoch 152/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6050
Epoch 153/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5992
Epoch 154/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5925
Epoch 155/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5953
Epoch 156/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5899
Epoch 157/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5960
Epoch 158/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5963
Epoch 159/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6052
Epoch 160/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6213
Epoch 161/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6517
Epoch 162/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6613
Epoch 163/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5941
Epoch 164/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5938
Epoch 165/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6148
Epoch 166/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.6169
Epoch 167/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6042
Epoch 168/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6015
Epoch 169/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.5850
Epoch 170/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5979
Epoch 171/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5919
Epoch 172/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5865
Epoch 173/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5903
Epoch 174/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5936
Epoch 175/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5742
Epoch 176/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5849
Epoch 177/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5925
Epoch 178/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5820
Epoch 179/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.5750
Epoch 180/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5998
Epoch 181/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5778
Epoch 182/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5776
Epoch 183/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5683
Epoch 184/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5760
Epoch 185/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5767
Epoch 186/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5964
Epoch 187/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5766
Epoch 188/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5787
Epoch 189/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5706
Epoch 190/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5642
Epoch 191/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5839
Epoch 192/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5801
Epoch 193/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.5664
Epoch 194/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5593
Epoch 195/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5601
Epoch 196/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5562
Epoch 197/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5705
Epoch 198/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5592
Epoch 199/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5657
Epoch 200/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5633
Epoch 201/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5811
Epoch 202/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5524
Epoch 203/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5573
Epoch 204/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5715
Epoch 205/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.6330
Epoch 206/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5756
Epoch 207/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5767
Epoch 208/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5743
Epoch 209/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5912
Epoch 210/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5746
Epoch 211/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5682
Epoch 212/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5593
Epoch 213/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5552
Epoch 214/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.5513
Epoch 215/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5621
Epoch 216/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5765
Epoch 217/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.5582
Epoch 218/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5613
Epoch 219/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5630
Epoch 220/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5490
Epoch 221/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5398
Epoch 222/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5513
Epoch 223/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5616
Epoch 224/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5562
Epoch 225/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5407
Epoch 226/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5777
Epoch 227/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5613
Epoch 228/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5426
Epoch 229/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5774
Epoch 230/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6289
Epoch 231/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.6246
Epoch 232/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.6114
Epoch 233/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5505
Epoch 234/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5442
Epoch 235/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5481
Epoch 236/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5558
Epoch 237/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5640
Epoch 238/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5762
Epoch 239/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5807
Epoch 240/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5607
Epoch 241/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.5305
Epoch 242/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5363
Epoch 243/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5389
Epoch 244/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5349
Epoch 245/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5480
Epoch 246/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5423
Epoch 247/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5265
Epoch 248/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5461
Epoch 249/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5600
Epoch 250/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5393
Epoch 251/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5742
Epoch 252/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5605
Epoch 253/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5376
Epoch 254/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5612
Epoch 255/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5493
Epoch 256/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5328
Epoch 257/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5379
Epoch 258/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5341
Epoch 259/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5378
Epoch 260/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5596
Epoch 261/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.5316
Epoch 262/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5894
Epoch 263/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5886
Epoch 264/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5514
Epoch 265/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.5341
Epoch 266/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5542
Epoch 267/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5488
Epoch 268/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5537
Epoch 269/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5158
Epoch 270/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.5175
Epoch 271/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5335
Epoch 272/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5297
Epoch 273/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5438
Epoch 274/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5211
Epoch 275/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5224
Epoch 276/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5301
Epoch 277/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5300
Epoch 278/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5242
Epoch 279/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5581
Epoch 280/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5602
Epoch 281/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5229
Epoch 282/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5211
Epoch 283/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5244
Epoch 284/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5133
Epoch 285/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5264
Epoch 286/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5398
Epoch 287/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5664
Epoch 288/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5609
Epoch 289/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.5300
Epoch 290/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5308
Epoch 291/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5363
Epoch 292/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5152
Epoch 293/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5233
Epoch 294/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5243
Epoch 295/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5526
Epoch 296/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5256
Epoch 297/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5166
Epoch 298/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5176
Epoch 299/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5311
Epoch 300/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5199
Epoch 301/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5168
Epoch 302/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5179
Epoch 303/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5326
Epoch 304/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5514
Epoch 305/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5159
Epoch 306/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5327
Epoch 307/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5149
Epoch 308/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5062
Epoch 309/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5167
Epoch 310/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5128
Epoch 311/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4996
Epoch 312/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5101
Epoch 313/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.5197
Epoch 314/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5244
Epoch 315/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5149
Epoch 316/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5031
Epoch 317/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5038
Epoch 318/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5014
Epoch 319/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5003
Epoch 320/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5168
Epoch 321/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5150
Epoch 322/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5330
Epoch 323/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5399
Epoch 324/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5837
Epoch 325/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5624
Epoch 326/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5438
Epoch 327/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5508
Epoch 328/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5268
Epoch 329/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5066
Epoch 330/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5103
Epoch 331/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5066
Epoch 332/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5149
Epoch 333/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5705
Epoch 334/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5294
Epoch 335/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5344
Epoch 336/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5519
Epoch 337/1000
```

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13/13 [==============================] - 0s 3ms/step - loss: 0.5316
Epoch 338/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5338
Epoch 339/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5176
Epoch 340/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4924
Epoch 341/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4977
Epoch 342/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4918
Epoch 343/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4912
Epoch 344/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4919
Epoch 345/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4882
Epoch 346/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4927
Epoch 347/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5046
Epoch 348/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5200
Epoch 349/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5069
Epoch 350/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5078
Epoch 351/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5019
Epoch 352/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5059
Epoch 353/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4981
Epoch 354/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4918
Epoch 355/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4945
Epoch 356/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4885
Epoch 357/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4901
Epoch 358/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5085
Epoch 359/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5091
Epoch 360/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5016
Epoch 361/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.5009
Epoch 362/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5345
Epoch 363/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5000
Epoch 364/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4916
Epoch 365/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4995
Epoch 366/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4880
Epoch 367/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4875
Epoch 368/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5087
Epoch 369/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4973
Epoch 370/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4983
Epoch 371/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4931
Epoch 372/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4857
Epoch 373/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4981
Epoch 374/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5115
Epoch 375/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5029
Epoch 376/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5152
Epoch 377/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4865
Epoch 378/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4977
Epoch 379/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5074
Epoch 380/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4781
Epoch 381/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5396
Epoch 382/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5069
Epoch 383/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5307
Epoch 384/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4899
Epoch 385/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4973
Epoch 386/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4799
Epoch 387/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4963
Epoch 388/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5063
Epoch 389/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4968
Epoch 390/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4818
Epoch 391/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4857
Epoch 392/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4882
Epoch 393/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4835
Epoch 394/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4820
Epoch 395/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5112
Epoch 396/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5247
Epoch 397/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5552
Epoch 398/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4918
Epoch 399/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4983
Epoch 400/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5034
Epoch 401/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4922
Epoch 402/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4887
Epoch 403/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4894
Epoch 404/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5069
Epoch 405/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4901
Epoch 406/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4851
Epoch 407/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4993
Epoch 408/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5236
Epoch 409/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4846
Epoch 410/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4871
Epoch 411/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5102
Epoch 412/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4781
Epoch 413/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4878
Epoch 414/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5123
Epoch 415/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5582
Epoch 416/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4744
Epoch 417/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5019
Epoch 418/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4824
Epoch 419/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4802
Epoch 420/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4689
Epoch 421/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4928
Epoch 422/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4989
Epoch 423/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4960
Epoch 424/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4718
Epoch 425/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4728
Epoch 426/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4741
Epoch 427/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5050
Epoch 428/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5020
Epoch 429/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4834
Epoch 430/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4839
Epoch 431/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4712
Epoch 432/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4728
Epoch 433/1000
```

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13/13 [==============================] - 0s 1ms/step - loss: 0.4744
Epoch 434/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4895
Epoch 435/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4844
Epoch 436/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4811
Epoch 437/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4876
Epoch 438/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4867
Epoch 439/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4849
Epoch 440/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4659
Epoch 441/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4843
Epoch 442/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4955
Epoch 443/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4792
Epoch 444/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4975
Epoch 445/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5037
Epoch 446/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5413
Epoch 447/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5125
Epoch 448/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5104
Epoch 449/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4718
Epoch 450/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4688
Epoch 451/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4700
Epoch 452/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4748
Epoch 453/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4865
Epoch 454/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4990
Epoch 455/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5044
Epoch 456/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5010
Epoch 457/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4604
Epoch 458/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4743
Epoch 459/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4600
Epoch 460/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4704
Epoch 461/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4734
Epoch 462/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4611
Epoch 463/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4615
Epoch 464/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4810
Epoch 465/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4620
Epoch 466/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5179
Epoch 467/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4669
Epoch 468/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4898
Epoch 469/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5280
Epoch 470/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4852
Epoch 471/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4716
Epoch 472/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4931
Epoch 473/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5223
Epoch 474/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5125
Epoch 475/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4927
Epoch 476/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4665
Epoch 477/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4745
Epoch 478/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4668
Epoch 479/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5035
Epoch 480/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5107
Epoch 481/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.5189
Epoch 482/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4660
Epoch 483/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5081
Epoch 484/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4698
Epoch 485/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4998
Epoch 486/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4739
Epoch 487/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4748
Epoch 488/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4635
Epoch 489/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4543
Epoch 490/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4666
Epoch 491/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4733
Epoch 492/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4962
Epoch 493/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4731
Epoch 494/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4574
Epoch 495/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4664
Epoch 496/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4773
Epoch 497/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5681
Epoch 498/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5085
Epoch 499/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4731
Epoch 500/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4930
Epoch 501/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4552
Epoch 502/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4649
Epoch 503/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4852
Epoch 504/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5127
Epoch 505/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.4980
Epoch 506/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5039
Epoch 507/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5173
Epoch 508/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4811
Epoch 509/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4696
Epoch 510/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4579
Epoch 511/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4757
Epoch 512/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4565
Epoch 513/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4569
Epoch 514/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4735
Epoch 515/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4653
Epoch 516/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4670
Epoch 517/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4640
Epoch 518/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4570
Epoch 519/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4549
Epoch 520/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4687
Epoch 521/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5037
Epoch 522/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4801
Epoch 523/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4854
Epoch 524/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4695
Epoch 525/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4746
Epoch 526/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4856
Epoch 527/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4507
Epoch 528/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4539
Epoch 529/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4873
Epoch 530/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4694
Epoch 531/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4829
Epoch 532/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4654
Epoch 533/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4533
Epoch 534/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4593
Epoch 535/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4736
Epoch 536/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4417
Epoch 537/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4931
Epoch 538/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4620
Epoch 539/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4472
Epoch 540/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4599
Epoch 541/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5128
Epoch 542/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4718
Epoch 543/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4651
Epoch 544/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4963
Epoch 545/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4984
Epoch 546/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4598
Epoch 547/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4789
Epoch 548/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4522
Epoch 549/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4681
Epoch 550/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4607
Epoch 551/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4750
Epoch 552/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4620
Epoch 553/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4565
Epoch 554/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4528
Epoch 555/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4882
Epoch 556/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4818
Epoch 557/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4633
Epoch 558/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4524
Epoch 559/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4792
Epoch 560/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4767
Epoch 561/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4426
Epoch 562/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4503
Epoch 563/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4448
Epoch 564/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4689
Epoch 565/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4630
Epoch 566/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4600
Epoch 567/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4599
Epoch 568/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4619
Epoch 569/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4586
Epoch 570/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4650
Epoch 571/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4613
Epoch 572/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4779
Epoch 573/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4621
Epoch 574/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4679
Epoch 575/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4824
Epoch 576/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4483
Epoch 577/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4471
Epoch 578/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5203
Epoch 579/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4738
Epoch 580/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4563
Epoch 581/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4932
Epoch 582/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4847
Epoch 583/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4794
Epoch 584/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4588
Epoch 585/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4756
Epoch 586/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4991
Epoch 587/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4629
Epoch 588/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4511
Epoch 589/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4323
Epoch 590/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4349
Epoch 591/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4466
Epoch 592/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4427
Epoch 593/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4522
Epoch 594/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4548
Epoch 595/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5090
Epoch 596/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4749
Epoch 597/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4448
Epoch 598/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4417
Epoch 599/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4393
Epoch 600/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4579
Epoch 601/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4340
Epoch 602/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4422
Epoch 603/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4395
Epoch 604/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4469
Epoch 605/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4555
Epoch 606/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4957
Epoch 607/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4595
Epoch 608/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4698
Epoch 609/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4383
Epoch 610/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4673
Epoch 611/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4526
Epoch 612/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4782
Epoch 613/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4487
Epoch 614/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4537
Epoch 615/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4697
Epoch 616/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4668
Epoch 617/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4403
Epoch 618/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4591
Epoch 619/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5116
Epoch 620/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4663
Epoch 621/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4548
Epoch 622/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4472
Epoch 623/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4549
Epoch 624/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4462
Epoch 625/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.4301
Epoch 626/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4519
Epoch 627/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4422
Epoch 628/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4559
Epoch 629/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4503
Epoch 630/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4516
Epoch 631/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4514
Epoch 632/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4550
Epoch 633/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4590
Epoch 634/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4976
Epoch 635/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4465
Epoch 636/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4611
Epoch 637/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4314
Epoch 638/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4370
Epoch 639/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4393
Epoch 640/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4922
Epoch 641/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4625
Epoch 642/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5074
Epoch 643/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5327
Epoch 644/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4769
Epoch 645/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5086
Epoch 646/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4901
Epoch 647/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4299
Epoch 648/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4488
Epoch 649/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4439
Epoch 650/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4454
Epoch 651/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4439
Epoch 652/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4303
Epoch 653/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4432
Epoch 654/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4530
Epoch 655/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4660
Epoch 656/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4512
Epoch 657/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4454
Epoch 658/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4314
Epoch 659/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4401
Epoch 660/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4729
Epoch 661/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4400
Epoch 662/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4430
Epoch 663/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4699
Epoch 664/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4648
Epoch 665/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4427
Epoch 666/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4661
Epoch 667/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4525
Epoch 668/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4363
Epoch 669/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4520
Epoch 670/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4310
Epoch 671/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4660
Epoch 672/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4911
Epoch 673/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4413
Epoch 674/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4540
Epoch 675/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4527
Epoch 676/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4439
Epoch 677/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4560
Epoch 678/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4387
Epoch 679/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4471
Epoch 680/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4333
Epoch 681/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4582
Epoch 682/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4382
Epoch 683/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4401
Epoch 684/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4363
Epoch 685/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4397
Epoch 686/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4422
Epoch 687/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4322
Epoch 688/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4228
Epoch 689/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4683
Epoch 690/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4577
Epoch 691/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4569
Epoch 692/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4513
Epoch 693/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4237
Epoch 694/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4315
Epoch 695/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4336
Epoch 696/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4301
Epoch 697/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4435
Epoch 698/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4677
Epoch 699/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4481
Epoch 700/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4545
Epoch 701/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4505
Epoch 702/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4457
Epoch 703/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4205
Epoch 704/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4474
Epoch 705/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4412
Epoch 706/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4416
Epoch 707/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4591
Epoch 708/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4550
Epoch 709/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4670
Epoch 710/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4589
Epoch 711/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4484
Epoch 712/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4833
Epoch 713/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4445
Epoch 714/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4452
Epoch 715/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4250
Epoch 716/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4150
Epoch 717/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4374
Epoch 718/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4288
Epoch 719/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4501
Epoch 720/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4521
Epoch 721/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.4426
Epoch 722/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4292
Epoch 723/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4361
Epoch 724/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4311
Epoch 725/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4439
Epoch 726/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4526
Epoch 727/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4452
Epoch 728/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4704
Epoch 729/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4262
Epoch 730/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4394
Epoch 731/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4449
Epoch 732/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4180
Epoch 733/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4271
Epoch 734/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4488
Epoch 735/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4186
Epoch 736/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4248
Epoch 737/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4305
Epoch 738/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4641
Epoch 739/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4604
Epoch 740/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4374
Epoch 741/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4710
Epoch 742/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5218
Epoch 743/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4587
Epoch 744/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4657
Epoch 745/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4437
Epoch 746/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4377
Epoch 747/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4214
Epoch 748/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4213
Epoch 749/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4994
Epoch 750/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4640
Epoch 751/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4234
Epoch 752/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4783
Epoch 753/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4549
Epoch 754/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4373
Epoch 755/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4336
Epoch 756/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4585
Epoch 757/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4700
Epoch 758/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4325
Epoch 759/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4507
Epoch 760/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4573
Epoch 761/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4541
Epoch 762/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4458
Epoch 763/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4274
Epoch 764/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4645
Epoch 765/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4691
Epoch 766/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4310
Epoch 767/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4348
Epoch 768/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4404
Epoch 769/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.4509
Epoch 770/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4635
Epoch 771/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4313
Epoch 772/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4288
Epoch 773/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4356
Epoch 774/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4749
Epoch 775/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4567
Epoch 776/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4502
Epoch 777/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4717
Epoch 778/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4722
Epoch 779/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4331
Epoch 780/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4403
Epoch 781/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4867
Epoch 782/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4367
Epoch 783/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4404
Epoch 784/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4350
Epoch 785/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4190
Epoch 786/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4218
Epoch 787/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4293
Epoch 788/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4209
Epoch 789/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4268
Epoch 790/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4713
Epoch 791/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4677
Epoch 792/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5326
Epoch 793/1000
```

```
13/13 [==============================] - 0s 3ms/step - loss: 0.4860
Epoch 794/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.5062
Epoch 795/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5388
Epoch 796/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4840
Epoch 797/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5376
Epoch 798/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.5497
Epoch 799/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4734
Epoch 800/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4402
Epoch 801/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4257
Epoch 802/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4150
Epoch 803/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4158
Epoch 804/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4205
Epoch 805/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4295
Epoch 806/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4292
Epoch 807/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4171
Epoch 808/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4304
Epoch 809/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4788
Epoch 810/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4305
Epoch 811/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4141
Epoch 812/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4169
Epoch 813/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4223
Epoch 814/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4168
Epoch 815/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4443
Epoch 816/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4505
Epoch 817/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4518
Epoch 818/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4240
Epoch 819/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4227
Epoch 820/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4707
Epoch 821/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4487
Epoch 822/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4590
Epoch 823/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4653
Epoch 824/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4490
Epoch 825/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4270
Epoch 826/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4224
Epoch 827/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4151
Epoch 828/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4369
Epoch 829/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4382
Epoch 830/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4563
Epoch 831/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4236
Epoch 832/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4180
Epoch 833/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4094
Epoch 834/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4167
Epoch 835/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4342
Epoch 836/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4484
Epoch 837/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4351
Epoch 838/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4410
Epoch 839/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4283
Epoch 840/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4515
Epoch 841/1000
```

```
13/13 [==============================] - 0s 2ms/step - loss: 0.4804
Epoch 842/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4197
Epoch 843/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4352
Epoch 844/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4425
Epoch 845/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4208
Epoch 846/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4370
Epoch 847/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4538
Epoch 848/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4194
Epoch 849/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4411
Epoch 850/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4484
Epoch 851/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4477
Epoch 852/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4351
Epoch 853/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4319
Epoch 854/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4269
Epoch 855/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4171
Epoch 856/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4179
Epoch 857/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4200
Epoch 858/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4226
Epoch 859/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4801
Epoch 860/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4219
Epoch 861/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4458
Epoch 862/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4490
Epoch 863/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4100
Epoch 864/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4665
Epoch 865/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4699
Epoch 866/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4448
Epoch 867/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4305
Epoch 868/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4167
Epoch 869/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4149
Epoch 870/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4555
Epoch 871/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4461
Epoch 872/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4055
Epoch 873/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4015
Epoch 874/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4146
Epoch 875/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4179
Epoch 876/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4315
Epoch 877/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4150
Epoch 878/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4233
Epoch 879/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4197
Epoch 880/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4269
Epoch 881/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4417
Epoch 882/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4555
Epoch 883/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4783
Epoch 884/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4646
Epoch 885/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4510
Epoch 886/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4065
Epoch 887/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4240
Epoch 888/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4344
Epoch 889/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4485
Epoch 890/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4250
Epoch 891/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4140
Epoch 892/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4319
Epoch 893/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4683
Epoch 894/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4260
Epoch 895/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4523
Epoch 896/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4118
Epoch 897/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4270
Epoch 898/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4296
Epoch 899/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4432
Epoch 900/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4243
Epoch 901/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4281
Epoch 902/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4253
Epoch 903/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4413
Epoch 904/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4084
Epoch 905/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4166
Epoch 906/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4271
Epoch 907/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4333
Epoch 908/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4262
Epoch 909/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4665
Epoch 910/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4322
Epoch 911/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4380
Epoch 912/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4384
Epoch 913/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4129
Epoch 914/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4369
Epoch 915/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4126
Epoch 916/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.3965
Epoch 917/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4115
Epoch 918/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4059
Epoch 919/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4157
Epoch 920/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4617
Epoch 921/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4539
Epoch 922/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4337
Epoch 923/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4489
Epoch 924/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4879
Epoch 925/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4501
Epoch 926/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4430
Epoch 927/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4677
Epoch 928/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4154
Epoch 929/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4102
Epoch 930/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4601
Epoch 931/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5159
Epoch 932/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5052
Epoch 933/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4658
Epoch 934/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4520
Epoch 935/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4250
Epoch 936/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4249
Epoch 937/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4062
Epoch 938/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4344
Epoch 939/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4334
Epoch 940/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4134
Epoch 941/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4028
Epoch 942/1000
13/13 [==============================] - 0s 4ms/step - loss: 0.4031
Epoch 943/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4098
Epoch 944/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4279
Epoch 945/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4228
Epoch 946/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4177
Epoch 947/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4441
Epoch 948/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4412
Epoch 949/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4108
Epoch 950/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4060
Epoch 951/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4017
Epoch 952/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4060
Epoch 953/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4185
Epoch 954/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4438
Epoch 955/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4277
Epoch 956/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4673
Epoch 957/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.5126
Epoch 958/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4279
Epoch 959/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4095
Epoch 960/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4276
Epoch 961/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4277
Epoch 962/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4032
Epoch 963/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4115
Epoch 964/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4028
Epoch 965/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4090
Epoch 966/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4175
Epoch 967/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4125
Epoch 968/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4216
Epoch 969/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4576
Epoch 970/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4428
Epoch 971/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4425
Epoch 972/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4371
Epoch 973/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4121
Epoch 974/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4125
Epoch 975/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4048
Epoch 976/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4070
Epoch 977/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4101
Epoch 978/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4041
Epoch 979/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4241
Epoch 980/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4539
Epoch 981/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4386
Epoch 982/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4308
Epoch 983/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4063
Epoch 984/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4202
Epoch 985/1000
```

```
13/13 [==============================] - 0s 1ms/step - loss: 0.4127
Epoch 986/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4018
Epoch 987/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4308
Epoch 988/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3997
Epoch 989/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4064
Epoch 990/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.3948
Epoch 991/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4166
Epoch 992/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4044
Epoch 993/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4087
Epoch 994/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4489
Epoch 995/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4242
Epoch 996/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4068
Epoch 997/1000
13/13 [==============================] - 0s 3ms/step - loss: 0.4396
Epoch 998/1000
13/13 [==============================] - 0s 2ms/step - loss: 0.4108
Epoch 999/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4226
Epoch 1000/1000
13/13 [==============================] - 0s 1ms/step - loss: 0.4581
Finished lambda = 0.3
```

[38]:
```
plot_iterate(lambdas, models, X_train, y_train, X_cv, y_cv)
```

```
Canvas(toolbar=Toolbar(toolitems=[('Home', 'Reset original view', 'home', 'home'), ('Back', 'Ba
```

As regularization is increased, the performance of the model on the training and cross-validation data sets converge. For this data set and model, lambda > 0.01 seems to be a reasonable choice.

7.1 Test Let's try our optimized models on the test set and compare them to 'ideal' performance.

[39]:
```
plt_compare(X_test,y_test, classes, model_predict_s, model_predict_r, centers)
```

```
Canvas(toolbar=Toolbar(toolitems=[('Home', 'Reset original view', 'home', 'home'), ('Back', 'Ba
```

Our test set is small and seems to have a number of outliers so classification error is high. However,

the performance of our optimized models is comparable to ideal performance.

2.1 Congratulations!

You have become familiar with important tools to apply when evaluating your machine learning models. Namely:
* splitting data into trained and untrained sets allows you to differentiate between underfitting and overfitting * creating three data sets, Training, Cross-Validation and Test allows you to * train your parameters W, B with the training set * tune model parameters such as complexity, regularization and number of examples with the cross-validation set * evaluate your 'real world' performance using the test set. * comparing training vs cross-validation performance provides insight into a model's propensity towards overfitting (high variance) or underfitting (high bias)

Please click here if you want to experiment with any of the non-graded code.

Important Note: Please only do this when you've already passed the assignment to avoid problems with the autograder.

On the notebook's menu, click "View" > "Cell Toolbar" > "Edit Metadata"

Hit the "Edit Metadata" button next to the code cell which you want to lock/unlock

Set the attribute value for "editable" to:

"true" if you want to unlock it

"false" if you want to lock it

```
    </li>
    <li> On the notebook's menu, click "View" > "Cell Toolbar" > "None" </li>
</ol>
<p> Here's a short demo of how to do the steps above:
    <br>
    <img src="https://drive.google.com/uc?export=view&id=14Xy_Mb17CZVgzVAgq7NCjMVBvSae3xO1" al
```