

# C2\_W3\_Assignment

April 24, 2024

## 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

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**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.

```
[49]: 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 assignment_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.

```
[50]: # 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.

```
[55]: 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()
```

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### 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.

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

### Exercise 1

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

```
[8]: # 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):
        ### START CODE HERE ###
        err+=(yhat[i]-y[i])**2
    err=err/(2*m)
    ### END CODE HERE ###

    return(err)

```

```

[9]: 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.

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

# 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.

```
[53]: 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.

```
[54]: # 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:

```
[58]: # 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).

```
[59]: 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.

```

[60]: 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:

```

[61]: 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)

```

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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 are 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 overfitting. Similar to degree, one can use the same methodology to tune the regularization parameter  $\lambda$ .

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

```
[62]: 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)
```

```
[63]: 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)
```

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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.

```
[64]: X_train, y_train, X_cv, y_cv, x, y_pred, err_train, err_cv, m_range, degree = ↳ tune_m(  
      ↳ 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.

```
[65]: # 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)
```

```
[66]: 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-validation 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](#).

```
[67]: # 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):
        ### START CODE HERE ###
        if (yhat[i] != y[i]):
            incorrect += 1;

    cerr = incorrect/m;
    ### END CODE HERE ###

    return(cerr)
```

```
[68]: 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

```
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.

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

tf.random.set_seed(1234)
model = Sequential(
    [
        ### START CODE HERE ###
        Dense(units=120,activation='relu',name="L1"),
        Dense(units=40,activation='relu',name="L2"),
        Dense(units=6,activation='linear',name="L3"),
```

```

        ### END CODE HERE ###

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

```

```

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

```

```

Epoch 1/1000
13/13 [=====] - 1s 1ms/step - loss: 1.1106
Epoch 2/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4281
Epoch 3/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3345
Epoch 4/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2896
Epoch 5/1000
13/13 [=====] - 0s 1ms/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 3ms/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 1ms/step - loss: 0.2115
Epoch 12/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2224  
Epoch 16/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2055  
Epoch 17/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2044  
Epoch 18/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.2237  
Epoch 22/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2497  
Epoch 23/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.2000  
Epoch 27/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.2424  
Epoch 31/1000  
13/13 [=====] - 0s 2ms/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 3ms/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 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 1ms/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 1ms/step - loss: 0.1763  
 Epoch 49/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1769  
 Epoch 50/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1763  
 Epoch 51/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2020  
 Epoch 52/1000  
 13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.1838  
 Epoch 56/1000  
 13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.1860  
 Epoch 60/1000  
 13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.2008  
 Epoch 65/1000  
 13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.2287  
 Epoch 69/1000  
 13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1836  
 Epoch 75/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1696  
 Epoch 76/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1542  
 Epoch 77/1000  
 13/13 [=====] - 0s 2ms/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 3ms/step - loss: 0.1658  
 Epoch 87/1000

```

13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.1475
Epoch 91/1000
13/13 [=====] - 0s 1ms/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 3ms/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 1ms/step - loss: 0.1855
Epoch 99/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1685
Epoch 100/1000
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.1600
Epoch 105/1000
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.1435
Epoch 109/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1419
Epoch 110/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1494
Epoch 111/1000

```



13/13 [=====] - 0s 1ms/step - loss: 0.1538  
Epoch 112/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1682  
Epoch 113/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1687  
Epoch 114/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1549  
Epoch 123/1000  
13/13 [=====] - 0s 1ms/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 3ms/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 1ms/step - loss: 0.1404  
Epoch 130/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1299  
Epoch 131/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1247  
Epoch 132/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1294  
Epoch 138/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1297  
Epoch 139/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1342  
Epoch 140/1000  
13/13 [=====] - 0s 1ms/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 3ms/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 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 1ms/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 1ms/step - loss: 0.1221  
Epoch 153/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.1192  
Epoch 157/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.1148  
Epoch 161/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.1327  
Epoch 165/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.1307  
Epoch 169/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1476  
Epoch 170/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.1225  
Epoch 174/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1276  
Epoch 175/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1029  
Epoch 176/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1134  
Epoch 177/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1081  
Epoch 178/1000  
13/13 [=====] - 0s 3ms/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 1ms/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 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 1ms/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 1ms/step - loss: 0.1161  
Epoch 208/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1137  
Epoch 209/1000  
13/13 [=====] - 0s 1ms/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 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 1ms/step - loss: 0.1047  
Epoch 216/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1044  
Epoch 217/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1044  
Epoch 218/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.0956  
Epoch 222/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1109  
Epoch 223/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1041  
Epoch 224/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1000  
Epoch 225/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0968  
Epoch 226/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0951  
Epoch 227/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.1153  
Epoch 231/1000

13/13 [=====] - 0s 1ms/step - loss: 0.1237  
Epoch 232/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0978  
Epoch 233/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1074  
Epoch 234/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1059  
Epoch 235/1000  
13/13 [=====] - 0s 1ms/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 3ms/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 3ms/step - loss: 0.0837  
Epoch 244/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0866  
Epoch 245/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0933  
Epoch 246/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0976  
Epoch 247/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1150  
Epoch 248/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0904  
Epoch 249/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1073  
Epoch 250/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1296  
Epoch 251/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1022  
Epoch 252/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0924  
Epoch 256/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0799  
Epoch 257/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0947  
Epoch 258/1000  
13/13 [=====] - 0s 2ms/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 3ms/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 1ms/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  
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 1ms/step - loss: 0.1017  
Epoch 279/1000

13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0798  
Epoch 283/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0602  
Epoch 288/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 1ms/step - loss: 0.0741  
Epoch 296/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0890  
Epoch 297/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 1ms/step - loss: 0.0671  
Epoch 306/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0696  
Epoch 310/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0772  
Epoch 315/1000  
13/13 [=====] - 0s 2ms/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 3ms/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 3ms/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 2ms/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 3ms/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 1ms/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 1ms/step - loss: 0.0999
Epoch 354/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0655
Epoch 358/1000
13/13 [=====] - 0s 3ms/step - loss: 0.0652
Epoch 359/1000
13/13 [=====] - 0s 2ms/step - loss: 0.0544
Epoch 360/1000
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.0506
Epoch 364/1000
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.0428
Epoch 368/1000
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.0516
Epoch 373/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0526
Epoch 374/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0463
Epoch 375/1000

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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 1ms/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 2ms/step - loss: 0.0461  
Epoch 381/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.0479  
Epoch 385/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0510  
Epoch 389/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0525  
Epoch 390/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0666  
Epoch 391/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.0663  
Epoch 395/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0844  
Epoch 396/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0704  
Epoch 397/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0700  
Epoch 398/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0591  
Epoch 399/1000

13/13 [=====] - 0s 1ms/step - loss: 0.0586  
Epoch 400/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0628  
Epoch 401/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1717  
Epoch 402/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1648  
Epoch 403/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1616  
Epoch 404/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1326  
Epoch 405/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1367  
Epoch 406/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.1268  
Epoch 410/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1123  
Epoch 411/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0720  
Epoch 412/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.0580  
Epoch 416/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.0573  
Epoch 420/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0721  
Epoch 421/1000  
13/13 [=====] - 0s 1ms/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 2ms/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 1ms/step - loss: 0.0412  
Epoch 433/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.0420  
Epoch 437/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0371  
Epoch 441/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0334  
Epoch 442/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0348  
Epoch 443/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0370  
Epoch 444/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0408  
Epoch 445/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0329  
Epoch 446/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0318  
Epoch 447/1000

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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 1ms/step - loss: 0.0346
Epoch 450/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0340
Epoch 451/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0394
Epoch 455/1000
13/13 [=====] - 0s 3ms/step - loss: 0.0584
Epoch 456/1000
13/13 [=====] - 0s 2ms/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 3ms/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 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 2ms/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 1ms/step - loss: 0.0543  
Epoch 473/1000  
13/13 [=====] - 0s 2ms/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 3ms/step - loss: 0.0365  
Epoch 504/1000  
13/13 [=====] - 0s 1ms/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 2ms/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 3ms/step - loss: 0.0308  
Epoch 518/1000  
13/13 [=====] - 0s 2ms/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 1ms/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 3ms/step - loss: 0.0365  
Epoch 527/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 3ms/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 1ms/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 1ms/step - loss: 0.0265  
 Epoch 544/1000  
 13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0302  
 Epoch 548/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.0323  
 Epoch 549/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.0262  
 Epoch 550/1000  
 13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.0376  
 Epoch 555/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.0346  
 Epoch 556/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.0296  
 Epoch 557/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.0307  
 Epoch 558/1000  
 13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.0249  
 Epoch 564/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.0265  
 Epoch 565/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.0297  
 Epoch 566/1000  
 13/13 [=====] - 0s 3ms/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 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 1ms/step - loss: 0.1534  
Epoch 574/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1474  
Epoch 575/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0637  
Epoch 579/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0431  
Epoch 583/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0300  
Epoch 584/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0309  
Epoch 585/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0307  
Epoch 586/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0321  
Epoch 587/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0266  
Epoch 588/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0305  
Epoch 592/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0278  
Epoch 593/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0343  
Epoch 594/1000  
13/13 [=====] - 0s 1ms/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 3ms/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 1ms/step - loss: 0.0241  
Epoch 601/1000  
13/13 [=====] - 0s 3ms/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 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 2ms/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 1ms/step - loss: 0.0236  
Epoch 615/1000

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13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.0241
Epoch 619/1000
13/13 [=====] - 0s 2ms/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 2ms/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 1ms/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 3ms/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 1ms/step - loss: 0.0235
Epoch 635/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.0223
Epoch 639/1000

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13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0257  
Epoch 643/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0213  
Epoch 644/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0277  
Epoch 645/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0266  
Epoch 646/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0320  
Epoch 647/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0269  
Epoch 648/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0357  
Epoch 649/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0321  
Epoch 650/1000  
13/13 [=====] - 0s 1ms/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 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 1ms/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 1ms/step - loss: 0.0246  
Epoch 662/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0313  
Epoch 663/1000

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13/13 [=====] - 0s 2ms/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 3ms/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 1ms/step - loss: 0.0441
Epoch 670/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0670
Epoch 674/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1732
Epoch 675/1000
13/13 [=====] - 0s 3ms/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 1ms/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 1ms/step - loss: 0.1581
Epoch 683/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1343
Epoch 684/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1065
Epoch 685/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1236
Epoch 686/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1184
Epoch 687/1000

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13/13 [=====] - 0s 1ms/step - loss: 0.1218
Epoch 688/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0579
Epoch 693/1000
13/13 [=====] - 0s 3ms/step - loss: 0.0563
Epoch 694/1000
13/13 [=====] - 0s 2ms/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 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 1ms/step - loss: 0.0282
Epoch 706/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0252
Epoch 711/1000

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13/13 [=====] - 0s 1ms/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 1ms/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 2ms/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 2ms/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 2ms/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 2ms/step - loss: 0.0230  
Epoch 737/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 3ms/step - loss: 0.0208  
Epoch 746/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0227  
Epoch 747/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0193  
Epoch 748/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0241  
Epoch 749/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0217  
Epoch 750/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.0203  
Epoch 755/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.0206  
Epoch 759/1000

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13/13 [=====] - 0s 1ms/step - loss: 0.0247
Epoch 760/1000
13/13 [=====] - 0s 2ms/step - loss: 0.0227
Epoch 761/1000
13/13 [=====] - 0s 2ms/step - loss: 0.0204
Epoch 762/1000
13/13 [=====] - 0s 3ms/step - loss: 0.0219
Epoch 763/1000
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.0451
Epoch 767/1000
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/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

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13/13 [=====] - 0s 1ms/step - loss: 0.1075
Epoch 784/1000
13/13 [=====] - 0s 3ms/step - loss: 0.0789
Epoch 785/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0467
Epoch 786/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0394
Epoch 787/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0360
Epoch 788/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0283
Epoch 792/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0250
Epoch 796/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0292
Epoch 797/1000
13/13 [=====] - 0s 3ms/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 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 1ms/step - loss: 0.0280  
Epoch 810/1000  
13/13 [=====] - 0s 3ms/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 3ms/step - loss: 0.0258  
Epoch 815/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.0247  
Epoch 819/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0247  
Epoch 828/1000  
13/13 [=====] - 0s 3ms/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 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 2ms/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 1ms/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 3ms/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 2ms/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 3ms/step - loss: 0.0220
Epoch 854/1000
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.0227  
Epoch 858/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.0228  
Epoch 863/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.0273  
Epoch 867/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0271  
Epoch 868/1000  
13/13 [=====] - 0s 1ms/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 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 2ms/step - loss: 0.0217  
Epoch 877/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0275  
Epoch 878/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0305  
Epoch 879/1000



13/13 [=====] - 0s 2ms/step - loss: 0.0440  
Epoch 880/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0466  
Epoch 881/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0729  
Epoch 882/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0460  
Epoch 883/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0439  
Epoch 884/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0811  
Epoch 885/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0291  
Epoch 886/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0309  
Epoch 887/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 1ms/step - loss: 0.0218  
Epoch 895/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0189  
Epoch 896/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0221  
Epoch 897/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0204  
Epoch 898/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0200  
Epoch 899/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0208  
Epoch 900/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0205  
Epoch 901/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.0290  
Epoch 905/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0272  
Epoch 906/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 3ms/step - loss: 0.1883  
Epoch 914/1000  
13/13 [=====] - 0s 1ms/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 2ms/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 1ms/step - loss: 0.0385  
Epoch 927/1000

13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0346  
Epoch 931/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0493  
Epoch 935/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0210  
Epoch 939/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0235  
Epoch 940/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0259  
Epoch 941/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0371  
Epoch 942/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.0367  
Epoch 946/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 2ms/step - loss: 0.0353
Epoch 954/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.0234
Epoch 958/1000
13/13 [=====] - 0s 3ms/step - loss: 0.0266
Epoch 959/1000
13/13 [=====] - 0s 2ms/step - loss: 0.0213
Epoch 960/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0200
Epoch 961/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0203
Epoch 962/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0261
Epoch 966/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0197
Epoch 967/1000
13/13 [=====] - 0s 3ms/step - loss: 0.0206
Epoch 968/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0188
Epoch 969/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0200
Epoch 970/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0169
Epoch 971/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0161
Epoch 975/1000

```

13/13 [=====] - 0s 1ms/step - loss: 0.0203  
Epoch 976/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0384  
Epoch 977/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0292  
Epoch 978/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0234  
Epoch 979/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0522  
Epoch 980/1000  
13/13 [=====] - 0s 3ms/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 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 1ms/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 1ms/step - loss: 0.0153  
Epoch 994/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0199  
Epoch 998/1000  
13/13 [=====] - 0s 2ms/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
```

[70]: <keras.callbacks.History at 0x7b7ead4ec050>

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

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

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
```

-----  
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
)

```

```

[72]: #make a model for plotting routines to call
model_predict = lambda X1: np.argmax(tf.nn.softmax(model.predict(X1)).
    ↪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', 'B

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.

```

[35]: 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.

```

[73]: # UNQ_C4
# GRADED CELL: model_s

```

```

tf.random.set_seed(1234)
model_s = Sequential(
    [
        ### START CODE HERE ###
        Dense(units=6,activation='relu',name="L1"),
        Dense(units=6,activation='linear',name="L2"),
        ### END CODE HERE ###
    ], name = "Simple"
)
model_s.compile(
    ### START CODE HERE ###
    loss=tf.keras.losses.SparseCategoricalCrossentropy(from_logits=True),
    optimizer=tf.keras.optimizers.Adam(0.01),
    ### START CODE HERE ###
)

```

```

[77]: 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 957us/step - loss: 1.4468
Epoch 3/1000
13/13 [=====] - 0s 900us/step - loss: 1.2902
Epoch 4/1000
13/13 [=====] - 0s 1ms/step - loss: 1.1367
Epoch 5/1000
13/13 [=====] - 0s 1ms/step - loss: 0.9710
Epoch 6/1000
13/13 [=====] - 0s 995us/step - loss: 0.7947
Epoch 7/1000
13/13 [=====] - 0s 958us/step - loss: 0.6499
Epoch 8/1000
13/13 [=====] - 0s 949us/step - loss: 0.5378
Epoch 9/1000
13/13 [=====] - 0s 895us/step - loss: 0.4652
Epoch 10/1000
13/13 [=====] - 0s 885us/step - loss: 0.4184
Epoch 11/1000

```



```

13/13 [=====] - 0s 1ms/step - loss: 0.3860
Epoch 12/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3641
Epoch 13/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3487
Epoch 14/1000
13/13 [=====] - 0s 960us/step - loss: 0.3316
Epoch 15/1000
13/13 [=====] - 0s 957us/step - loss: 0.3201
Epoch 16/1000
13/13 [=====] - 0s 990us/step - loss: 0.3110
Epoch 17/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3026
Epoch 18/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2953
Epoch 19/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2880
Epoch 20/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2824
Epoch 21/1000
13/13 [=====] - 0s 988us/step - loss: 0.2768
Epoch 22/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2716
Epoch 23/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2690
Epoch 24/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2618
Epoch 25/1000
13/13 [=====] - 0s 914us/step - loss: 0.2606
Epoch 26/1000
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.2497
Epoch 30/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2424
Epoch 31/1000
13/13 [=====] - 0s 973us/step - loss: 0.2406
Epoch 32/1000
13/13 [=====] - 0s 941us/step - loss: 0.2386
Epoch 33/1000
13/13 [=====] - 0s 987us/step - loss: 0.2371
Epoch 34/1000
13/13 [=====] - 0s 950us/step - loss: 0.2355
Epoch 35/1000

```

```

13/13 [=====] - 0s 1ms/step - loss: 0.2328
Epoch 36/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2311
Epoch 37/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2289
Epoch 38/1000
13/13 [=====] - 0s 962us/step - loss: 0.2271
Epoch 39/1000
13/13 [=====] - 0s 989us/step - loss: 0.2278
Epoch 40/1000
13/13 [=====] - 0s 1ms/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 936us/step - loss: 0.2228
Epoch 44/1000
13/13 [=====] - 0s 902us/step - loss: 0.2227
Epoch 45/1000
13/13 [=====] - 0s 936us/step - loss: 0.2230
Epoch 46/1000
13/13 [=====] - 0s 935us/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 1ms/step - loss: 0.2156
Epoch 50/1000
13/13 [=====] - 0s 970us/step - loss: 0.2165
Epoch 51/1000
13/13 [=====] - 0s 948us/step - loss: 0.2155
Epoch 52/1000
13/13 [=====] - 0s 1ms/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 996us/step - loss: 0.2105
Epoch 56/1000
13/13 [=====] - 0s 983us/step - loss: 0.2116
Epoch 57/1000
13/13 [=====] - 0s 973us/step - loss: 0.2121
Epoch 58/1000
13/13 [=====] - 0s 943us/step - loss: 0.2084
Epoch 59/1000

```

13/13 [=====] - 0s 936us/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 1ms/step - loss: 0.2116  
 Epoch 64/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2085  
 Epoch 65/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2120  
 Epoch 66/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2087  
 Epoch 67/1000  
 13/13 [=====] - 0s 934us/step - loss: 0.2107  
 Epoch 68/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2090  
 Epoch 69/1000  
 13/13 [=====] - 0s 954us/step - loss: 0.2084  
 Epoch 70/1000  
 13/13 [=====] - 0s 982us/step - loss: 0.2053  
 Epoch 71/1000  
 13/13 [=====] - 0s 949us/step - loss: 0.2060  
 Epoch 72/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2061  
 Epoch 73/1000  
 13/13 [=====] - 0s 994us/step - loss: 0.2075  
 Epoch 74/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2067  
 Epoch 75/1000  
 13/13 [=====] - 0s 988us/step - loss: 0.2039  
 Epoch 76/1000  
 13/13 [=====] - 0s 962us/step - loss: 0.2036  
 Epoch 77/1000  
 13/13 [=====] - 0s 952us/step - loss: 0.2062  
 Epoch 78/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2017  
 Epoch 79/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2044  
 Epoch 80/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2055  
 Epoch 81/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1999  
 Epoch 82/1000  
 13/13 [=====] - 0s 999us/step - loss: 0.2028  
 Epoch 83/1000

```

13/13 [=====] - 0s 953us/step - loss: 0.2019
Epoch 84/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2042
Epoch 85/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2016
Epoch 86/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2068
Epoch 87/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2005
Epoch 88/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2011
Epoch 89/1000
13/13 [=====] - 0s 983us/step - loss: 0.2000
Epoch 90/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1998
Epoch 91/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1992
Epoch 92/1000
13/13 [=====] - 0s 986us/step - loss: 0.2001
Epoch 93/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1997
Epoch 94/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2008
Epoch 95/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2015
Epoch 96/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2011
Epoch 97/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2006
Epoch 98/1000
13/13 [=====] - 0s 949us/step - loss: 0.2031
Epoch 99/1000
13/13 [=====] - 0s 915us/step - loss: 0.1991
Epoch 100/1000
13/13 [=====] - 0s 972us/step - loss: 0.2006
Epoch 101/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2010
Epoch 102/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2018
Epoch 103/1000
13/13 [=====] - 0s 933us/step - loss: 0.2026
Epoch 104/1000
13/13 [=====] - 0s 959us/step - loss: 0.1988
Epoch 105/1000
13/13 [=====] - 0s 928us/step - loss: 0.1974
Epoch 106/1000
13/13 [=====] - 0s 925us/step - loss: 0.1966
Epoch 107/1000

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13/13 [=====] - 0s 999us/step - loss: 0.1963
Epoch 108/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1969
Epoch 109/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1987
Epoch 110/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1978
Epoch 111/1000
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.1987
Epoch 115/1000
13/13 [=====] - 0s 973us/step - loss: 0.1934
Epoch 116/1000
13/13 [=====] - 0s 995us/step - loss: 0.2009
Epoch 117/1000
13/13 [=====] - 0s 992us/step - loss: 0.1943
Epoch 118/1000
13/13 [=====] - 0s 1000us/step - loss: 0.1969
Epoch 119/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1951
Epoch 120/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1964
Epoch 121/1000
13/13 [=====] - 0s 976us/step - loss: 0.1957
Epoch 122/1000
13/13 [=====] - 0s 967us/step - loss: 0.1970
Epoch 123/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1960
Epoch 124/1000
13/13 [=====] - 0s 924us/step - loss: 0.1973
Epoch 125/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1961
Epoch 126/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1957
Epoch 127/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1949
Epoch 128/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1946
Epoch 129/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1944
Epoch 130/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1969
Epoch 131/1000

```

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13/13 [=====] - 0s 931us/step - loss: 0.1926
Epoch 132/1000
13/13 [=====] - 0s 954us/step - loss: 0.1925
Epoch 133/1000
13/13 [=====] - 0s 975us/step - loss: 0.1933
Epoch 134/1000
13/13 [=====] - 0s 956us/step - loss: 0.1942
Epoch 135/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1976
Epoch 136/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1939
Epoch 137/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1931
Epoch 138/1000
13/13 [=====] - 0s 918us/step - loss: 0.1947
Epoch 139/1000
13/13 [=====] - 0s 973us/step - loss: 0.1941
Epoch 140/1000
13/13 [=====] - 0s 927us/step - loss: 0.1917
Epoch 141/1000
13/13 [=====] - 0s 934us/step - loss: 0.1922
Epoch 142/1000
13/13 [=====] - 0s 1ms/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 997us/step - loss: 0.1921
Epoch 146/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1920
Epoch 147/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1925
Epoch 148/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1899
Epoch 149/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1913
Epoch 150/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1914
Epoch 151/1000
13/13 [=====] - 0s 985us/step - loss: 0.1944
Epoch 152/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1920
Epoch 153/1000
13/13 [=====] - 0s 956us/step - loss: 0.1949
Epoch 154/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1904
Epoch 155/1000

```

13/13 [=====] - 0s 1ms/step - loss: 0.1917  
 Epoch 156/1000  
 13/13 [=====] - 0s 959us/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 1ms/step - loss: 0.1898  
 Epoch 160/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1910  
 Epoch 161/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1913  
 Epoch 162/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1930  
 Epoch 163/1000  
 13/13 [=====] - 0s 973us/step - loss: 0.1913  
 Epoch 164/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1907  
 Epoch 165/1000  
 13/13 [=====] - 0s 980us/step - loss: 0.1910  
 Epoch 166/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1891  
 Epoch 167/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1940  
 Epoch 168/1000  
 13/13 [=====] - 0s 933us/step - loss: 0.1914  
 Epoch 169/1000  
 13/13 [=====] - 0s 925us/step - loss: 0.1914  
 Epoch 170/1000  
 13/13 [=====] - 0s 975us/step - loss: 0.1893  
 Epoch 171/1000  
 13/13 [=====] - 0s 983us/step - loss: 0.1894  
 Epoch 172/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1879  
 Epoch 173/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1924  
 Epoch 174/1000  
 13/13 [=====] - 0s 897us/step - loss: 0.1887  
 Epoch 175/1000  
 13/13 [=====] - 0s 856us/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 1ms/step - loss: 0.1881
Epoch 180/1000
13/13 [=====] - 0s 947us/step - loss: 0.1894
Epoch 181/1000
13/13 [=====] - 0s 902us/step - loss: 0.1906
Epoch 182/1000
13/13 [=====] - 0s 916us/step - loss: 0.1894
Epoch 183/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1872
Epoch 184/1000
13/13 [=====] - 0s 972us/step - loss: 0.1893
Epoch 185/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1885
Epoch 186/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1867
Epoch 187/1000
13/13 [=====] - 0s 991us/step - loss: 0.1866
Epoch 188/1000
13/13 [=====] - 0s 996us/step - loss: 0.1884
Epoch 189/1000
13/13 [=====] - 0s 967us/step - loss: 0.1907
Epoch 190/1000
13/13 [=====] - 0s 885us/step - loss: 0.1890
Epoch 191/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1880
Epoch 192/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1863
Epoch 193/1000
13/13 [=====] - 0s 999us/step - loss: 0.1904
Epoch 194/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1857
Epoch 195/1000
13/13 [=====] - 0s 1ms/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 930us/step - loss: 0.1884
Epoch 199/1000
13/13 [=====] - 0s 895us/step - loss: 0.1894
Epoch 200/1000
13/13 [=====] - 0s 910us/step - loss: 0.1860
Epoch 201/1000
13/13 [=====] - 0s 892us/step - loss: 0.1869
Epoch 202/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1837
Epoch 203/1000

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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 944us/step - loss: 0.1846  
 Epoch 206/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1881  
 Epoch 207/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1841  
 Epoch 208/1000  
 13/13 [=====] - 0s 978us/step - loss: 0.1902  
 Epoch 209/1000  
 13/13 [=====] - 0s 871us/step - loss: 0.1850  
 Epoch 210/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1883  
 Epoch 211/1000  
 13/13 [=====] - 0s 909us/step - loss: 0.1863  
 Epoch 212/1000  
 13/13 [=====] - 0s 921us/step - loss: 0.1856  
 Epoch 213/1000  
 13/13 [=====] - 0s 980us/step - loss: 0.1860  
 Epoch 214/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1890  
 Epoch 215/1000  
 13/13 [=====] - 0s 989us/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 1ms/step - loss: 0.1857  
 Epoch 220/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1844  
 Epoch 221/1000  
 13/13 [=====] - 0s 933us/step - loss: 0.1846  
 Epoch 222/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1843  
 Epoch 223/1000  
 13/13 [=====] - 0s 931us/step - loss: 0.1878  
 Epoch 224/1000  
 13/13 [=====] - 0s 915us/step - loss: 0.1884  
 Epoch 225/1000  
 13/13 [=====] - 0s 993us/step - loss: 0.1851  
 Epoch 226/1000  
 13/13 [=====] - 0s 904us/step - loss: 0.1844  
 Epoch 227/1000

13/13 [=====] - 0s 1ms/step - loss: 0.1824  
 Epoch 228/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1849  
 Epoch 229/1000  
 13/13 [=====] - 0s 2ms/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 978us/step - loss: 0.1882  
 Epoch 233/1000  
 13/13 [=====] - 0s 939us/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 971us/step - loss: 0.1841  
 Epoch 237/1000  
 13/13 [=====] - 0s 939us/step - loss: 0.1876  
 Epoch 238/1000  
 13/13 [=====] - 0s 999us/step - loss: 0.1923  
 Epoch 239/1000  
 13/13 [=====] - 0s 975us/step - loss: 0.1867  
 Epoch 240/1000  
 13/13 [=====] - 0s 985us/step - loss: 0.1832  
 Epoch 241/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1863  
 Epoch 242/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1978  
 Epoch 243/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1946  
 Epoch 244/1000  
 13/13 [=====] - 0s 990us/step - loss: 0.1871  
 Epoch 245/1000  
 13/13 [=====] - 0s 1ms/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 982us/step - loss: 0.1820  
 Epoch 249/1000  
 13/13 [=====] - 0s 981us/step - loss: 0.1857  
 Epoch 250/1000  
 13/13 [=====] - 0s 954us/step - loss: 0.1829  
 Epoch 251/1000

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13/13 [=====] - 0s 1ms/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 986us/step - loss: 0.1832
Epoch 255/1000
13/13 [=====] - 0s 987us/step - loss: 0.1830
Epoch 256/1000
13/13 [=====] - 0s 991us/step - loss: 0.1830
Epoch 257/1000
13/13 [=====] - 0s 990us/step - loss: 0.1833
Epoch 258/1000
13/13 [=====] - 0s 960us/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 1ms/step - loss: 0.1826
Epoch 263/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1827
Epoch 264/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1820
Epoch 265/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1831
Epoch 266/1000
13/13 [=====] - 0s 928us/step - loss: 0.1805
Epoch 267/1000
13/13 [=====] - 0s 947us/step - loss: 0.1835
Epoch 268/1000
13/13 [=====] - 0s 950us/step - loss: 0.1812
Epoch 269/1000
13/13 [=====] - 0s 930us/step - loss: 0.1817
Epoch 270/1000
13/13 [=====] - 0s 955us/step - loss: 0.1836
Epoch 271/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1801
Epoch 272/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1868
Epoch 273/1000
13/13 [=====] - 0s 948us/step - loss: 0.1869
Epoch 274/1000
13/13 [=====] - 0s 937us/step - loss: 0.1815
Epoch 275/1000

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13/13 [=====] - 0s 970us/step - loss: 0.1847
Epoch 276/1000
13/13 [=====] - 0s 940us/step - loss: 0.1787
Epoch 277/1000
13/13 [=====] - 0s 897us/step - loss: 0.1841
Epoch 278/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1804
Epoch 279/1000
13/13 [=====] - 0s 956us/step - loss: 0.1861
Epoch 280/1000
13/13 [=====] - 0s 983us/step - loss: 0.1816
Epoch 281/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1797
Epoch 282/1000
13/13 [=====] - 0s 990us/step - loss: 0.1807
Epoch 283/1000
13/13 [=====] - 0s 966us/step - loss: 0.1815
Epoch 284/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1822
Epoch 285/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1813
Epoch 286/1000
13/13 [=====] - 0s 965us/step - loss: 0.1815
Epoch 287/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1829
Epoch 288/1000
13/13 [=====] - 0s 976us/step - loss: 0.1849
Epoch 289/1000
13/13 [=====] - 0s 949us/step - loss: 0.1805
Epoch 290/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1807
Epoch 291/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1801
Epoch 292/1000
13/13 [=====] - 0s 954us/step - loss: 0.1793
Epoch 293/1000
13/13 [=====] - 0s 942us/step - loss: 0.1815
Epoch 294/1000
13/13 [=====] - 0s 928us/step - loss: 0.1784
Epoch 295/1000
13/13 [=====] - 0s 974us/step - loss: 0.1867
Epoch 296/1000
13/13 [=====] - 0s 941us/step - loss: 0.1805
Epoch 297/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1855
Epoch 298/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1816
Epoch 299/1000

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```

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 940us/step - loss: 0.1878
Epoch 303/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1788
Epoch 304/1000
13/13 [=====] - 0s 963us/step - loss: 0.1850
Epoch 305/1000
13/13 [=====] - 0s 920us/step - loss: 0.1827
Epoch 306/1000
13/13 [=====] - 0s 904us/step - loss: 0.1818
Epoch 307/1000
13/13 [=====] - 0s 911us/step - loss: 0.1811
Epoch 308/1000
13/13 [=====] - 0s 981us/step - loss: 0.1827
Epoch 309/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1814
Epoch 310/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1854
Epoch 311/1000
13/13 [=====] - 0s 931us/step - loss: 0.1785
Epoch 312/1000
13/13 [=====] - 0s 919us/step - loss: 0.1831
Epoch 313/1000
13/13 [=====] - 0s 937us/step - loss: 0.1775
Epoch 314/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1820
Epoch 315/1000
13/13 [=====] - 0s 967us/step - loss: 0.1801
Epoch 316/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1792
Epoch 317/1000
13/13 [=====] - 0s 999us/step - loss: 0.1847
Epoch 318/1000
13/13 [=====] - 0s 947us/step - loss: 0.1841
Epoch 319/1000
13/13 [=====] - 0s 993us/step - loss: 0.1811
Epoch 320/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1841
Epoch 321/1000
13/13 [=====] - 0s 995us/step - loss: 0.1785
Epoch 322/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1815
Epoch 323/1000

```

```

13/13 [=====] - 0s 1ms/step - loss: 0.1792
Epoch 324/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1829
Epoch 325/1000
13/13 [=====] - 0s 978us/step - loss: 0.1800
Epoch 326/1000
13/13 [=====] - 0s 952us/step - loss: 0.1783
Epoch 327/1000
13/13 [=====] - 0s 943us/step - loss: 0.1797
Epoch 328/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1846
Epoch 329/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1790
Epoch 330/1000
13/13 [=====] - 0s 1000us/step - loss: 0.1815
Epoch 331/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1801
Epoch 332/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1803
Epoch 333/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1824
Epoch 334/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1849
Epoch 335/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1835
Epoch 336/1000
13/13 [=====] - 0s 966us/step - loss: 0.1797
Epoch 337/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1805
Epoch 338/1000
13/13 [=====] - 0s 990us/step - loss: 0.1796
Epoch 339/1000
13/13 [=====] - 0s 933us/step - loss: 0.1807
Epoch 340/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1794
Epoch 341/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1808
Epoch 342/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1790
Epoch 343/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1797
Epoch 344/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1804
Epoch 345/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1838
Epoch 346/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1832
Epoch 347/1000

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13/13 [=====] - 0s 995us/step - loss: 0.1819
Epoch 348/1000
13/13 [=====] - 0s 977us/step - loss: 0.1800
Epoch 349/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1789
Epoch 350/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1787
Epoch 351/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1792
Epoch 356/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1786
Epoch 357/1000
13/13 [=====] - 0s 1ms/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 925us/step - loss: 0.1821
Epoch 361/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1789
Epoch 362/1000
13/13 [=====] - 0s 997us/step - loss: 0.1798
Epoch 363/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1815
Epoch 364/1000
13/13 [=====] - 0s 1ms/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 994us/step - loss: 0.1776
Epoch 368/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1784
Epoch 369/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1819
Epoch 370/1000
13/13 [=====] - 0s 919us/step - loss: 0.1771
Epoch 371/1000

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13/13 [=====] - 0s 886us/step - loss: 0.1799  
 Epoch 372/1000  
 13/13 [=====] - 0s 881us/step - loss: 0.1780  
 Epoch 373/1000  
 13/13 [=====] - 0s 955us/step - loss: 0.1773  
 Epoch 374/1000  
 13/13 [=====] - 0s 915us/step - loss: 0.1769  
 Epoch 375/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1770  
 Epoch 376/1000  
 13/13 [=====] - 0s 930us/step - loss: 0.1766  
 Epoch 377/1000  
 13/13 [=====] - 0s 889us/step - loss: 0.1768  
 Epoch 378/1000  
 13/13 [=====] - 0s 895us/step - loss: 0.1794  
 Epoch 379/1000  
 13/13 [=====] - 0s 898us/step - loss: 0.1799  
 Epoch 380/1000  
 13/13 [=====] - 0s 922us/step - loss: 0.1768  
 Epoch 381/1000  
 13/13 [=====] - 0s 898us/step - loss: 0.1805  
 Epoch 382/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1782  
 Epoch 383/1000  
 13/13 [=====] - 0s 979us/step - loss: 0.1843  
 Epoch 384/1000  
 13/13 [=====] - 0s 944us/step - loss: 0.1763  
 Epoch 385/1000  
 13/13 [=====] - 0s 979us/step - loss: 0.1790  
 Epoch 386/1000  
 13/13 [=====] - 0s 949us/step - loss: 0.1781  
 Epoch 387/1000  
 13/13 [=====] - 0s 928us/step - loss: 0.1771  
 Epoch 388/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1809  
 Epoch 389/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1807  
 Epoch 390/1000  
 13/13 [=====] - 0s 970us/step - loss: 0.1792  
 Epoch 391/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1767  
 Epoch 392/1000  
 13/13 [=====] - 0s 967us/step - loss: 0.1767  
 Epoch 393/1000  
 13/13 [=====] - 0s 936us/step - loss: 0.1763  
 Epoch 394/1000  
 13/13 [=====] - 0s 924us/step - loss: 0.1768  
 Epoch 395/1000



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13/13 [=====] - 0s 1ms/step - loss: 0.1789
Epoch 396/1000
13/13 [=====] - 0s 932us/step - loss: 0.1801
Epoch 397/1000
13/13 [=====] - 0s 952us/step - loss: 0.1805
Epoch 398/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1783
Epoch 399/1000
13/13 [=====] - 0s 966us/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 1ms/step - loss: 0.1771
Epoch 403/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1765
Epoch 404/1000
13/13 [=====] - 0s 923us/step - loss: 0.1775
Epoch 405/1000
13/13 [=====] - 0s 981us/step - loss: 0.1753
Epoch 406/1000
13/13 [=====] - 0s 891us/step - loss: 0.1759
Epoch 407/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1776
Epoch 408/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1779
Epoch 409/1000
13/13 [=====] - 0s 939us/step - loss: 0.1759
Epoch 410/1000
13/13 [=====] - 0s 984us/step - loss: 0.1798
Epoch 411/1000
13/13 [=====] - 0s 953us/step - loss: 0.1807
Epoch 412/1000
13/13 [=====] - 0s 929us/step - loss: 0.1778
Epoch 413/1000
13/13 [=====] - 0s 901us/step - loss: 0.1771
Epoch 414/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1760
Epoch 415/1000
13/13 [=====] - 0s 929us/step - loss: 0.1760
Epoch 416/1000
13/13 [=====] - 0s 912us/step - loss: 0.1782
Epoch 417/1000
13/13 [=====] - 0s 973us/step - loss: 0.1756
Epoch 418/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1762
Epoch 419/1000

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13/13 [=====] - 0s 965us/step - loss: 0.1756
Epoch 420/1000
13/13 [=====] - 0s 952us/step - loss: 0.1773
Epoch 421/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1761
Epoch 422/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1753
Epoch 423/1000
13/13 [=====] - 0s 963us/step - loss: 0.1777
Epoch 424/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1754
Epoch 425/1000
13/13 [=====] - 0s 975us/step - loss: 0.1779
Epoch 426/1000
13/13 [=====] - 0s 980us/step - loss: 0.1781
Epoch 427/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1739
Epoch 428/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1757
Epoch 429/1000
13/13 [=====] - 0s 894us/step - loss: 0.1755
Epoch 430/1000
13/13 [=====] - 0s 942us/step - loss: 0.1775
Epoch 431/1000
13/13 [=====] - 0s 943us/step - loss: 0.1775
Epoch 432/1000
13/13 [=====] - 0s 954us/step - loss: 0.1773
Epoch 433/1000
13/13 [=====] - 0s 952us/step - loss: 0.1777
Epoch 434/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1781
Epoch 435/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1761
Epoch 436/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1775
Epoch 437/1000
13/13 [=====] - 0s 1ms/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 980us/step - loss: 0.1765
Epoch 442/1000
13/13 [=====] - 0s 930us/step - loss: 0.1776
Epoch 443/1000

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13/13 [=====] - 0s 1ms/step - loss: 0.1755
Epoch 444/1000
13/13 [=====] - 0s 1ms/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 950us/step - loss: 0.1792
Epoch 448/1000
13/13 [=====] - 0s 902us/step - loss: 0.1746
Epoch 449/1000
13/13 [=====] - 0s 956us/step - loss: 0.1752
Epoch 450/1000
13/13 [=====] - 0s 976us/step - loss: 0.1773
Epoch 451/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1772
Epoch 452/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1764
Epoch 453/1000
13/13 [=====] - 0s 970us/step - loss: 0.1754
Epoch 454/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1748
Epoch 455/1000
13/13 [=====] - 0s 950us/step - loss: 0.1752
Epoch 456/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1753
Epoch 457/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1785
Epoch 458/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1744
Epoch 459/1000
13/13 [=====] - 0s 935us/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 997us/step - loss: 0.1745
Epoch 463/1000
13/13 [=====] - 0s 942us/step - loss: 0.1792
Epoch 464/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1752
Epoch 465/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1756
Epoch 466/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1752
Epoch 467/1000

```

13/13 [=====] - 0s 983us/step - loss: 0.1774  
Epoch 468/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1748  
Epoch 469/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1767  
Epoch 470/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1813  
Epoch 471/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1793  
Epoch 472/1000  
13/13 [=====] - 0s 945us/step - loss: 0.1748  
Epoch 473/1000  
13/13 [=====] - 0s 918us/step - loss: 0.1762  
Epoch 474/1000  
13/13 [=====] - 0s 944us/step - loss: 0.1822  
Epoch 475/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1788  
Epoch 476/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1760  
Epoch 477/1000  
13/13 [=====] - 0s 953us/step - loss: 0.1758  
Epoch 478/1000  
13/13 [=====] - 0s 958us/step - loss: 0.1763  
Epoch 479/1000  
13/13 [=====] - 0s 939us/step - loss: 0.1751  
Epoch 480/1000  
13/13 [=====] - 0s 922us/step - loss: 0.1749  
Epoch 481/1000  
13/13 [=====] - 0s 901us/step - loss: 0.1742  
Epoch 482/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1745  
Epoch 483/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1763  
Epoch 484/1000  
13/13 [=====] - 0s 977us/step - loss: 0.1767  
Epoch 485/1000  
13/13 [=====] - 0s 959us/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 1ms/step - loss: 0.1755  
Epoch 489/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1766  
Epoch 490/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1783  
Epoch 491/1000

13/13 [=====] - 0s 1ms/step - loss: 0.1769  
 Epoch 492/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1752  
 Epoch 493/1000  
 13/13 [=====] - 0s 961us/step - loss: 0.1772  
 Epoch 494/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1739  
 Epoch 495/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1750  
 Epoch 496/1000  
 13/13 [=====] - 0s 911us/step - loss: 0.1798  
 Epoch 497/1000  
 13/13 [=====] - 0s 922us/step - loss: 0.1744  
 Epoch 498/1000  
 13/13 [=====] - 0s 958us/step - loss: 0.1750  
 Epoch 499/1000  
 13/13 [=====] - 0s 930us/step - loss: 0.1750  
 Epoch 500/1000  
 13/13 [=====] - 0s 962us/step - loss: 0.1735  
 Epoch 501/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1783  
 Epoch 502/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1749  
 Epoch 503/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1749  
 Epoch 504/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1741  
 Epoch 505/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1767  
 Epoch 506/1000  
 13/13 [=====] - 0s 972us/step - loss: 0.1752  
 Epoch 507/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1764  
 Epoch 508/1000  
 13/13 [=====] - 0s 942us/step - loss: 0.1719  
 Epoch 509/1000  
 13/13 [=====] - 0s 934us/step - loss: 0.1791  
 Epoch 510/1000  
 13/13 [=====] - 0s 915us/step - loss: 0.1746  
 Epoch 511/1000  
 13/13 [=====] - 0s 940us/step - loss: 0.1786  
 Epoch 512/1000  
 13/13 [=====] - 0s 978us/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

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13/13 [=====] - 0s 2ms/step - loss: 0.1730
Epoch 516/1000
13/13 [=====] - 0s 955us/step - loss: 0.1738
Epoch 517/1000
13/13 [=====] - 0s 945us/step - loss: 0.1729
Epoch 518/1000
13/13 [=====] - 0s 913us/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 971us/step - loss: 0.1762
Epoch 522/1000
13/13 [=====] - 0s 965us/step - loss: 0.1750
Epoch 523/1000
13/13 [=====] - 0s 982us/step - loss: 0.1751
Epoch 524/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1747
Epoch 525/1000
13/13 [=====] - 0s 1ms/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 990us/step - loss: 0.1810
Epoch 529/1000
13/13 [=====] - 0s 992us/step - loss: 0.1770
Epoch 530/1000
13/13 [=====] - 0s 983us/step - loss: 0.1740
Epoch 531/1000
13/13 [=====] - 0s 908us/step - loss: 0.1743
Epoch 532/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1759
Epoch 533/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1749
Epoch 537/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1713
Epoch 538/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1774
Epoch 539/1000

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```

13/13 [=====] - 0s 1ms/step - loss: 0.1741
Epoch 540/1000
13/13 [=====] - 0s 989us/step - loss: 0.1774
Epoch 541/1000
13/13 [=====] - 0s 977us/step - loss: 0.1734
Epoch 542/1000
13/13 [=====] - 0s 981us/step - loss: 0.1754
Epoch 543/1000
13/13 [=====] - 0s 935us/step - loss: 0.1735
Epoch 544/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1750
Epoch 549/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1747
Epoch 550/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1768
Epoch 551/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1732
Epoch 552/1000
13/13 [=====] - 0s 986us/step - loss: 0.1736
Epoch 553/1000
13/13 [=====] - 0s 963us/step - loss: 0.1725
Epoch 554/1000
13/13 [=====] - 0s 994us/step - loss: 0.1748
Epoch 555/1000
13/13 [=====] - 0s 931us/step - loss: 0.1733
Epoch 556/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1727
Epoch 557/1000
13/13 [=====] - 0s 1ms/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 963us/step - loss: 0.1784
Epoch 562/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1715
Epoch 563/1000

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13/13 [=====] - 0s 1ms/step - loss: 0.1730
Epoch 564/1000
13/13 [=====] - 0s 936us/step - loss: 0.1733
Epoch 565/1000
13/13 [=====] - 0s 986us/step - loss: 0.1718
Epoch 566/1000
13/13 [=====] - 0s 992us/step - loss: 0.1750
Epoch 567/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1751
Epoch 568/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1728
Epoch 569/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1730
Epoch 570/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1761
Epoch 571/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1798
Epoch 572/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1762
Epoch 573/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1727
Epoch 574/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1722
Epoch 575/1000
13/13 [=====] - 0s 909us/step - loss: 0.1717
Epoch 576/1000
13/13 [=====] - 0s 905us/step - loss: 0.1730
Epoch 577/1000
13/13 [=====] - 0s 965us/step - loss: 0.1751
Epoch 578/1000
13/13 [=====] - 0s 909us/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 987us/step - loss: 0.1731
Epoch 582/1000
13/13 [=====] - 0s 925us/step - loss: 0.1709
Epoch 583/1000
13/13 [=====] - 0s 943us/step - loss: 0.1727
Epoch 584/1000
13/13 [=====] - 0s 943us/step - loss: 0.1742
Epoch 585/1000
13/13 [=====] - 0s 911us/step - loss: 0.1721
Epoch 586/1000
13/13 [=====] - 0s 962us/step - loss: 0.1730
Epoch 587/1000

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13/13 [=====] - 0s 1ms/step - loss: 0.1728
Epoch 588/1000
13/13 [=====] - 0s 991us/step - loss: 0.1718
Epoch 589/1000
13/13 [=====] - 0s 941us/step - loss: 0.1710
Epoch 590/1000
13/13 [=====] - 0s 972us/step - loss: 0.1787
Epoch 591/1000
13/13 [=====] - 0s 965us/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 1ms/step - loss: 0.1727
Epoch 595/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1738
Epoch 596/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1746
Epoch 597/1000
13/13 [=====] - 0s 928us/step - loss: 0.1734
Epoch 598/1000
13/13 [=====] - 0s 969us/step - loss: 0.1738
Epoch 599/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1707
Epoch 600/1000
13/13 [=====] - 0s 989us/step - loss: 0.1735
Epoch 601/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1731
Epoch 602/1000
13/13 [=====] - 0s 965us/step - loss: 0.1727
Epoch 603/1000
13/13 [=====] - 0s 950us/step - loss: 0.1722
Epoch 604/1000
13/13 [=====] - 0s 962us/step - loss: 0.1720
Epoch 605/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1747
Epoch 606/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1770
Epoch 607/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1741
Epoch 608/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1748
Epoch 609/1000
13/13 [=====] - 0s 994us/step - loss: 0.1731
Epoch 610/1000
13/13 [=====] - 0s 980us/step - loss: 0.1743
Epoch 611/1000

```

```

13/13 [=====] - 0s 1ms/step - loss: 0.1725
Epoch 612/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1706
Epoch 613/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1732
Epoch 614/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1746
Epoch 615/1000
13/13 [=====] - 0s 1ms/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 975us/step - loss: 0.1802
Epoch 619/1000
13/13 [=====] - 0s 957us/step - loss: 0.1725
Epoch 620/1000
13/13 [=====] - 0s 943us/step - loss: 0.1773
Epoch 621/1000
13/13 [=====] - 0s 925us/step - loss: 0.1710
Epoch 622/1000
13/13 [=====] - 0s 885us/step - loss: 0.1746
Epoch 623/1000
13/13 [=====] - 0s 889us/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 1ms/step - loss: 0.1717
Epoch 627/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1728
Epoch 628/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1711
Epoch 629/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1732
Epoch 630/1000
13/13 [=====] - 0s 906us/step - loss: 0.1719
Epoch 631/1000
13/13 [=====] - 0s 917us/step - loss: 0.1711
Epoch 632/1000
13/13 [=====] - 0s 883us/step - loss: 0.1752
Epoch 633/1000
13/13 [=====] - 0s 936us/step - loss: 0.1731
Epoch 634/1000
13/13 [=====] - 0s 980us/step - loss: 0.1758
Epoch 635/1000

```

13/13 [=====] - 0s 908us/step - loss: 0.1713  
 Epoch 636/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1744  
 Epoch 637/1000  
 13/13 [=====] - 0s 977us/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 1ms/step - loss: 0.1732  
 Epoch 641/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1736  
 Epoch 642/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1700  
 Epoch 643/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1705  
 Epoch 644/1000  
 13/13 [=====] - 0s 920us/step - loss: 0.1725  
 Epoch 645/1000  
 13/13 [=====] - 0s 960us/step - loss: 0.1711  
 Epoch 646/1000  
 13/13 [=====] - 0s 986us/step - loss: 0.1723  
 Epoch 647/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1719  
 Epoch 648/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1718  
 Epoch 649/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1740  
 Epoch 650/1000  
 13/13 [=====] - 0s 922us/step - loss: 0.1737  
 Epoch 651/1000  
 13/13 [=====] - 0s 936us/step - loss: 0.1705  
 Epoch 652/1000  
 13/13 [=====] - 0s 909us/step - loss: 0.1699  
 Epoch 653/1000  
 13/13 [=====] - 0s 876us/step - loss: 0.1712  
 Epoch 654/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1704  
 Epoch 655/1000  
 13/13 [=====] - 0s 968us/step - loss: 0.1705  
 Epoch 656/1000  
 13/13 [=====] - 0s 917us/step - loss: 0.1701  
 Epoch 657/1000  
 13/13 [=====] - 0s 909us/step - loss: 0.1701  
 Epoch 658/1000  
 13/13 [=====] - 0s 901us/step - loss: 0.1739  
 Epoch 659/1000

```

13/13 [=====] - 0s 983us/step - loss: 0.1712
Epoch 660/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1697
Epoch 661/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1718
Epoch 662/1000
13/13 [=====] - 0s 951us/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 926us/step - loss: 0.1700
Epoch 666/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1740
Epoch 667/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1693
Epoch 668/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1722
Epoch 669/1000
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.1733
Epoch 673/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1726
Epoch 674/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1740
Epoch 675/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1795
Epoch 680/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1709
Epoch 681/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1703
Epoch 682/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1717
Epoch 683/1000

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13/13 [=====] - 0s 1ms/step - loss: 0.1758
Epoch 684/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1699
Epoch 685/1000
13/13 [=====] - 0s 980us/step - loss: 0.1753
Epoch 686/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1728
Epoch 687/1000
13/13 [=====] - 0s 968us/step - loss: 0.1733
Epoch 688/1000
13/13 [=====] - 0s 938us/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 1ms/step - loss: 0.1712
Epoch 693/1000
13/13 [=====] - 0s 980us/step - loss: 0.1716
Epoch 694/1000
13/13 [=====] - 0s 940us/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 1ms/step - loss: 0.1708
Epoch 699/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1702
Epoch 700/1000
13/13 [=====] - 0s 942us/step - loss: 0.1737
Epoch 701/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1720
Epoch 702/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1701
Epoch 703/1000
13/13 [=====] - 0s 960us/step - loss: 0.1710
Epoch 704/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1690
Epoch 705/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1719
Epoch 706/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1718
Epoch 707/1000

```

```

13/13 [=====] - 0s 1ms/step - loss: 0.1680
Epoch 708/1000
13/13 [=====] - 0s 990us/step - loss: 0.1756
Epoch 709/1000
13/13 [=====] - 0s 990us/step - loss: 0.1754
Epoch 710/1000
13/13 [=====] - 0s 976us/step - loss: 0.1721
Epoch 711/1000
13/13 [=====] - 0s 971us/step - loss: 0.1751
Epoch 712/1000
13/13 [=====] - 0s 992us/step - loss: 0.1714
Epoch 713/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1716
Epoch 714/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1703
Epoch 715/1000
13/13 [=====] - 0s 975us/step - loss: 0.1704
Epoch 716/1000
13/13 [=====] - 0s 937us/step - loss: 0.1749
Epoch 717/1000
13/13 [=====] - 0s 967us/step - loss: 0.1676
Epoch 718/1000
13/13 [=====] - 0s 986us/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 943us/step - loss: 0.1712
Epoch 723/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1697
Epoch 724/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1718
Epoch 725/1000
13/13 [=====] - 0s 956us/step - loss: 0.1741
Epoch 726/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1719
Epoch 727/1000
13/13 [=====] - 0s 994us/step - loss: 0.1716
Epoch 728/1000
13/13 [=====] - 0s 943us/step - loss: 0.1713
Epoch 729/1000
13/13 [=====] - 0s 965us/step - loss: 0.1694
Epoch 730/1000
13/13 [=====] - 0s 937us/step - loss: 0.1764
Epoch 731/1000

```

```

13/13 [=====] - 0s 935us/step - loss: 0.1758
Epoch 732/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1735
Epoch 733/1000
13/13 [=====] - 0s 985us/step - loss: 0.1700
Epoch 734/1000
13/13 [=====] - 0s 970us/step - loss: 0.1698
Epoch 735/1000
13/13 [=====] - 0s 979us/step - loss: 0.1699
Epoch 736/1000
13/13 [=====] - 0s 923us/step - loss: 0.1716
Epoch 737/1000
13/13 [=====] - 0s 939us/step - loss: 0.1701
Epoch 738/1000
13/13 [=====] - 0s 1ms/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 997us/step - loss: 0.1684
Epoch 743/1000
13/13 [=====] - 0s 934us/step - loss: 0.1713
Epoch 744/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1695
Epoch 745/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1715
Epoch 746/1000
13/13 [=====] - 0s 992us/step - loss: 0.1690
Epoch 747/1000
13/13 [=====] - 0s 999us/step - loss: 0.1706
Epoch 748/1000
13/13 [=====] - 0s 925us/step - loss: 0.1687
Epoch 749/1000
13/13 [=====] - 0s 931us/step - loss: 0.1694
Epoch 750/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1700
Epoch 751/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1697
Epoch 752/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1696
Epoch 753/1000
13/13 [=====] - 0s 937us/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 927us/step - loss: 0.1766
Epoch 757/1000
13/13 [=====] - 0s 1ms/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 990us/step - loss: 0.1684
Epoch 762/1000
13/13 [=====] - 0s 932us/step - loss: 0.1731
Epoch 763/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1725
Epoch 764/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1754
Epoch 765/1000
13/13 [=====] - 0s 935us/step - loss: 0.1697
Epoch 766/1000
13/13 [=====] - 0s 941us/step - loss: 0.1735
Epoch 767/1000
13/13 [=====] - 0s 962us/step - loss: 0.1705
Epoch 768/1000
13/13 [=====] - 0s 997us/step - loss: 0.1699
Epoch 769/1000
13/13 [=====] - 0s 979us/step - loss: 0.1701
Epoch 770/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1712
Epoch 775/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1704
Epoch 776/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1681
Epoch 777/1000
13/13 [=====] - 0s 990us/step - loss: 0.1704
Epoch 778/1000
13/13 [=====] - 0s 944us/step - loss: 0.1721
Epoch 779/1000

```



```

13/13 [=====] - 0s 972us/step - loss: 0.1706
Epoch 780/1000
13/13 [=====] - 0s 959us/step - loss: 0.1747
Epoch 781/1000
13/13 [=====] - 0s 997us/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 956us/step - loss: 0.1691
Epoch 785/1000
13/13 [=====] - 0s 946us/step - loss: 0.1710
Epoch 786/1000
13/13 [=====] - 0s 951us/step - loss: 0.1770
Epoch 787/1000
13/13 [=====] - 0s 891us/step - loss: 0.1710
Epoch 788/1000
13/13 [=====] - 0s 879us/step - loss: 0.1672
Epoch 789/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1706
Epoch 790/1000
13/13 [=====] - 0s 938us/step - loss: 0.1718
Epoch 791/1000
13/13 [=====] - 0s 950us/step - loss: 0.1678
Epoch 792/1000
13/13 [=====] - 0s 922us/step - loss: 0.1691
Epoch 793/1000
13/13 [=====] - 0s 897us/step - loss: 0.1715
Epoch 794/1000
13/13 [=====] - 0s 961us/step - loss: 0.1784
Epoch 795/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1659
Epoch 796/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1756
Epoch 797/1000
13/13 [=====] - 0s 979us/step - loss: 0.1708
Epoch 798/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1706
Epoch 799/1000
13/13 [=====] - 0s 960us/step - loss: 0.1695
Epoch 800/1000
13/13 [=====] - 0s 978us/step - loss: 0.1668
Epoch 801/1000
13/13 [=====] - 0s 897us/step - loss: 0.1703
Epoch 802/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1683
Epoch 803/1000

```

13/13 [=====] - 0s 977us/step - loss: 0.1704  
 Epoch 804/1000  
 13/13 [=====] - 0s 962us/step - loss: 0.1701  
 Epoch 805/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1691  
 Epoch 806/1000  
 13/13 [=====] - 0s 908us/step - loss: 0.1712  
 Epoch 807/1000  
 13/13 [=====] - 0s 896us/step - loss: 0.1679  
 Epoch 808/1000  
 13/13 [=====] - 0s 969us/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 961us/step - loss: 0.1694  
 Epoch 814/1000  
 13/13 [=====] - 0s 922us/step - loss: 0.1676  
 Epoch 815/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1698  
 Epoch 816/1000  
 13/13 [=====] - 0s 979us/step - loss: 0.1717  
 Epoch 817/1000  
 13/13 [=====] - 0s 947us/step - loss: 0.1712  
 Epoch 818/1000  
 13/13 [=====] - 0s 998us/step - loss: 0.1681  
 Epoch 819/1000  
 13/13 [=====] - 0s 993us/step - loss: 0.1723  
 Epoch 820/1000  
 13/13 [=====] - 0s 938us/step - loss: 0.1733  
 Epoch 821/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1692  
 Epoch 822/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1745  
 Epoch 823/1000  
 13/13 [=====] - 0s 973us/step - loss: 0.1762  
 Epoch 824/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1713  
 Epoch 825/1000  
 13/13 [=====] - 0s 979us/step - loss: 0.1697  
 Epoch 826/1000  
 13/13 [=====] - 0s 880us/step - loss: 0.1698  
 Epoch 827/1000

13/13 [=====] - 0s 948us/step - loss: 0.1720  
 Epoch 828/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1696  
 Epoch 829/1000  
 13/13 [=====] - 0s 978us/step - loss: 0.1707  
 Epoch 830/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1693  
 Epoch 831/1000  
 13/13 [=====] - 0s 986us/step - loss: 0.1691  
 Epoch 832/1000  
 13/13 [=====] - 0s 959us/step - loss: 0.1689  
 Epoch 833/1000  
 13/13 [=====] - 0s 936us/step - loss: 0.1716  
 Epoch 834/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1669  
 Epoch 835/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1683  
 Epoch 836/1000  
 13/13 [=====] - 0s 897us/step - loss: 0.1673  
 Epoch 837/1000  
 13/13 [=====] - 0s 911us/step - loss: 0.1684  
 Epoch 838/1000  
 13/13 [=====] - 0s 893us/step - loss: 0.1688  
 Epoch 839/1000  
 13/13 [=====] - 0s 939us/step - loss: 0.1695  
 Epoch 840/1000  
 13/13 [=====] - 0s 905us/step - loss: 0.1689  
 Epoch 841/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1702  
 Epoch 842/1000  
 13/13 [=====] - 0s 987us/step - loss: 0.1711  
 Epoch 843/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1689  
 Epoch 844/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1682  
 Epoch 845/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1694  
 Epoch 846/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1678  
 Epoch 847/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1693  
 Epoch 848/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1707  
 Epoch 849/1000  
 13/13 [=====] - 0s 977us/step - loss: 0.1699  
 Epoch 850/1000  
 13/13 [=====] - 0s 973us/step - loss: 0.1683  
 Epoch 851/1000

13/13 [=====] - 0s 1ms/step - loss: 0.1688  
 Epoch 852/1000  
 13/13 [=====] - 0s 932us/step - loss: 0.1751  
 Epoch 853/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1707  
 Epoch 854/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1680  
 Epoch 855/1000  
 13/13 [=====] - 0s 879us/step - loss: 0.1688  
 Epoch 856/1000  
 13/13 [=====] - 0s 907us/step - loss: 0.1690  
 Epoch 857/1000  
 13/13 [=====] - 0s 954us/step - loss: 0.1676  
 Epoch 858/1000  
 13/13 [=====] - 0s 996us/step - loss: 0.1720  
 Epoch 859/1000  
 13/13 [=====] - 0s 926us/step - loss: 0.1691  
 Epoch 860/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1692  
 Epoch 861/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1705  
 Epoch 862/1000  
 13/13 [=====] - 0s 943us/step - loss: 0.1675  
 Epoch 863/1000  
 13/13 [=====] - 0s 961us/step - loss: 0.1715  
 Epoch 864/1000  
 13/13 [=====] - 0s 916us/step - loss: 0.1684  
 Epoch 865/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1703  
 Epoch 866/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1702  
 Epoch 867/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1695  
 Epoch 868/1000  
 13/13 [=====] - 0s 950us/step - loss: 0.1728  
 Epoch 869/1000  
 13/13 [=====] - 0s 974us/step - loss: 0.1682  
 Epoch 870/1000  
 13/13 [=====] - 0s 985us/step - loss: 0.1681  
 Epoch 871/1000  
 13/13 [=====] - 0s 974us/step - loss: 0.1684  
 Epoch 872/1000  
 13/13 [=====] - 0s 974us/step - loss: 0.1680  
 Epoch 873/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1720  
 Epoch 874/1000  
 13/13 [=====] - 0s 973us/step - loss: 0.1705  
 Epoch 875/1000

13/13 [=====] - 0s 1ms/step - loss: 0.1686  
 Epoch 876/1000  
 13/13 [=====] - 0s 955us/step - loss: 0.1676  
 Epoch 877/1000  
 13/13 [=====] - 0s 978us/step - loss: 0.1750  
 Epoch 878/1000  
 13/13 [=====] - 0s 971us/step - loss: 0.1728  
 Epoch 879/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1733  
 Epoch 880/1000  
 13/13 [=====] - 0s 1ms/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 980us/step - loss: 0.1727  
 Epoch 884/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1697  
 Epoch 885/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1670  
 Epoch 886/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1675  
 Epoch 887/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1723  
 Epoch 888/1000  
 13/13 [=====] - 0s 991us/step - loss: 0.1701  
 Epoch 889/1000  
 13/13 [=====] - 0s 893us/step - loss: 0.1677  
 Epoch 890/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1712  
 Epoch 891/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1684  
 Epoch 892/1000  
 13/13 [=====] - 0s 964us/step - loss: 0.1695  
 Epoch 893/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1680  
 Epoch 894/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1694  
 Epoch 895/1000  
 13/13 [=====] - 0s 958us/step - loss: 0.1683  
 Epoch 896/1000  
 13/13 [=====] - 0s 963us/step - loss: 0.1694  
 Epoch 897/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1714  
 Epoch 898/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1682  
 Epoch 899/1000

13/13 [=====] - 0s 1ms/step - loss: 0.1704  
 Epoch 900/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1664  
 Epoch 901/1000  
 13/13 [=====] - 0s 942us/step - loss: 0.1683  
 Epoch 902/1000  
 13/13 [=====] - 0s 930us/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 1ms/step - loss: 0.1686  
 Epoch 906/1000  
 13/13 [=====] - 0s 959us/step - loss: 0.1739  
 Epoch 907/1000  
 13/13 [=====] - 0s 964us/step - loss: 0.1693  
 Epoch 908/1000  
 13/13 [=====] - 0s 994us/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 934us/step - loss: 0.1672  
 Epoch 912/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1672  
 Epoch 913/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1702  
 Epoch 914/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1662  
 Epoch 915/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1716  
 Epoch 916/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1669  
 Epoch 917/1000  
 13/13 [=====] - 0s 901us/step - loss: 0.1704  
 Epoch 918/1000  
 13/13 [=====] - 0s 929us/step - loss: 0.1659  
 Epoch 919/1000  
 13/13 [=====] - 0s 982us/step - loss: 0.1725  
 Epoch 920/1000  
 13/13 [=====] - 0s 937us/step - loss: 0.1718  
 Epoch 921/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1670  
 Epoch 922/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1695  
 Epoch 923/1000

13/13 [=====] - 0s 949us/step - loss: 0.1670  
 Epoch 924/1000  
 13/13 [=====] - 0s 919us/step - loss: 0.1672  
 Epoch 925/1000  
 13/13 [=====] - 0s 934us/step - loss: 0.1685  
 Epoch 926/1000  
 13/13 [=====] - 0s 931us/step - loss: 0.1681  
 Epoch 927/1000  
 13/13 [=====] - 0s 931us/step - loss: 0.1698  
 Epoch 928/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1660  
 Epoch 929/1000  
 13/13 [=====] - 0s 964us/step - loss: 0.1704  
 Epoch 930/1000  
 13/13 [=====] - 0s 887us/step - loss: 0.1678  
 Epoch 931/1000  
 13/13 [=====] - 0s 946us/step - loss: 0.1703  
 Epoch 932/1000  
 13/13 [=====] - 0s 948us/step - loss: 0.1700  
 Epoch 933/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1699  
 Epoch 934/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1691  
 Epoch 935/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1689  
 Epoch 936/1000  
 13/13 [=====] - 0s 966us/step - loss: 0.1680  
 Epoch 937/1000  
 13/13 [=====] - 0s 980us/step - loss: 0.1701  
 Epoch 938/1000  
 13/13 [=====] - 0s 972us/step - loss: 0.1681  
 Epoch 939/1000  
 13/13 [=====] - 0s 948us/step - loss: 0.1693  
 Epoch 940/1000  
 13/13 [=====] - 0s 913us/step - loss: 0.1703  
 Epoch 941/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1674  
 Epoch 942/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1667  
 Epoch 943/1000  
 13/13 [=====] - 0s 948us/step - loss: 0.1682  
 Epoch 944/1000  
 13/13 [=====] - 0s 925us/step - loss: 0.1706  
 Epoch 945/1000  
 13/13 [=====] - 0s 962us/step - loss: 0.1679  
 Epoch 946/1000  
 13/13 [=====] - 0s 943us/step - loss: 0.1647  
 Epoch 947/1000

13/13 [=====] - 0s 911us/step - loss: 0.1759  
 Epoch 948/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1712  
 Epoch 949/1000  
 13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1662  
 Epoch 953/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1751  
 Epoch 954/1000  
 13/13 [=====] - 0s 999us/step - loss: 0.1705  
 Epoch 955/1000  
 13/13 [=====] - 0s 972us/step - loss: 0.1661  
 Epoch 956/1000  
 13/13 [=====] - 0s 937us/step - loss: 0.1658  
 Epoch 957/1000  
 13/13 [=====] - 0s 915us/step - loss: 0.1676  
 Epoch 958/1000  
 13/13 [=====] - 0s 900us/step - loss: 0.1718  
 Epoch 959/1000  
 13/13 [=====] - 0s 906us/step - loss: 0.1644  
 Epoch 960/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1697  
 Epoch 961/1000  
 13/13 [=====] - 0s 962us/step - loss: 0.1654  
 Epoch 962/1000  
 13/13 [=====] - 0s 985us/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 962us/step - loss: 0.1713  
 Epoch 966/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1671  
 Epoch 967/1000  
 13/13 [=====] - 0s 988us/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 952us/step - loss: 0.1664  
 Epoch 972/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1684  
 Epoch 973/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1660  
 Epoch 974/1000  
 13/13 [=====] - 0s 942us/step - loss: 0.1678  
 Epoch 975/1000  
 13/13 [=====] - 0s 940us/step - loss: 0.1675  
 Epoch 976/1000  
 13/13 [=====] - 0s 977us/step - loss: 0.1710  
 Epoch 977/1000  
 13/13 [=====] - 0s 995us/step - loss: 0.1722  
 Epoch 978/1000  
 13/13 [=====] - 0s 945us/step - loss: 0.1648  
 Epoch 979/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1716  
 Epoch 980/1000  
 13/13 [=====] - 0s 980us/step - loss: 0.1666  
 Epoch 981/1000  
 13/13 [=====] - 0s 993us/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 2ms/step - loss: 0.1658  
 Epoch 986/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1691  
 Epoch 987/1000  
 13/13 [=====] - 0s 988us/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 983us/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 954us/step - loss: 0.1678
Epoch 997/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1689
Epoch 998/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1701
Epoch 999/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1711
Epoch 1000/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1628

```

[77]: <keras.callbacks.History at 0x7b7ead101510>

```

[78]: # 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 #
L1 (Dense)	(None, 6)	18
L2 (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

```
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
)
```

```
[79]: #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, subtitle="Simple_
    ↪Model")
```

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

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

```
[80]: 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.

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

tf.random.set_seed(1234)
model_r = Sequential(
    [
        ### START CODE HERE ###
        Dense(units=120,activation='relu',name="L1", kernel_regularizer=tf.
→keras.regularizers.l2(0.1)),
        Dense(units=40,activation='relu',name="L2", kernel_regularizer=tf.keras.
→regularizers.l2(0.1)),
        Dense(units=6,activation='linear',name="L3"),
        ### START CODE HERE ###
    ], name= None
)
model_r.compile(
    ### START CODE HERE ###
    loss=tf.keras.losses.SparseCategoricalCrossentropy(from_logits=True),
    optimizer=tf.keras.optimizers.Adam(0.01),
    ### START CODE HERE ###
)
```

```
[82]: # 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 2ms/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 2ms/step - loss: 0.9481
Epoch 8/1000
13/13 [=====] - 0s 3ms/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 3ms/step - loss: 0.7521
Epoch 13/1000
13/13 [=====] - 0s 2ms/step - loss: 0.7430
Epoch 14/1000
13/13 [=====] - 0s 2ms/step - loss: 0.7474
Epoch 15/1000
13/13 [=====] - 0s 1ms/step - loss: 0.7045
Epoch 16/1000
13/13 [=====] - 0s 3ms/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 1ms/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 3ms/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 2ms/step - loss: 0.6216

```

Epoch 31/1000  
13/13 [=====] - 0s 2ms/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 1ms/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 1ms/step - loss: 0.5940  
Epoch 38/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5739  
Epoch 39/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5686  
Epoch 40/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5697  
Epoch 41/1000  
13/13 [=====] - 0s 2ms/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 3ms/step - loss: 0.5313  
Epoch 51/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.5209

```

Epoch 55/1000
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.5135
Epoch 64/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5322
Epoch 65/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5148
Epoch 66/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5021
Epoch 67/1000
13/13 [=====] - 0s 3ms/step - loss: 0.5041
Epoch 68/1000
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.5115
Epoch 72/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5003
Epoch 73/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4989
Epoch 74/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5097
Epoch 75/1000
13/13 [=====] - 0s 3ms/step - loss: 0.5001
Epoch 76/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5060
Epoch 77/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4977
Epoch 78/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5227

```

```

Epoch 79/1000
13/13 [=====] - 0s 3ms/step - loss: 0.5380
Epoch 80/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5101
Epoch 81/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5247
Epoch 82/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4910
Epoch 83/1000
13/13 [=====] - 0s 3ms/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 1ms/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 1ms/step - loss: 0.4696
Epoch 91/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4759
Epoch 92/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4731
Epoch 93/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4599
Epoch 94/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4623
Epoch 95/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4669
Epoch 96/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4961
Epoch 100/1000
13/13 [=====] - 0s 3ms/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

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Epoch 103/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4739
Epoch 104/1000
13/13 [=====] - 0s 3ms/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 3ms/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 3ms/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 1ms/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 1ms/step - loss: 0.4736
Epoch 121/1000
13/13 [=====] - 0s 3ms/step - loss: 0.5020
Epoch 122/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4630
Epoch 123/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4543
Epoch 124/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4465
Epoch 125/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4328
Epoch 126/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4386

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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 2ms/step - loss: 0.4371
Epoch 131/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4542
Epoch 132/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4331
Epoch 133/1000
13/13 [=====] - 0s 2ms/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 3ms/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 3ms/step - loss: 0.4264
Epoch 146/1000
13/13 [=====] - 0s 2ms/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 3ms/step - loss: 0.4239
Epoch 150/1000
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4391  
Epoch 154/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4280  
Epoch 158/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4210  
Epoch 159/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4066  
Epoch 160/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4302  
Epoch 161/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4433  
Epoch 162/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4284  
Epoch 163/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4595  
Epoch 167/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4336  
Epoch 171/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4206  
Epoch 172/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4214  
Epoch 173/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4343  
Epoch 174/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4415

Epoch 175/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4200  
Epoch 176/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4431  
Epoch 177/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4323  
Epoch 178/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4162  
Epoch 179/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4214  
Epoch 180/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4130  
Epoch 181/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4324  
Epoch 182/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4232  
Epoch 183/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4093  
Epoch 184/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4030  
Epoch 185/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4055  
Epoch 186/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3974  
Epoch 190/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3971  
Epoch 191/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4116  
Epoch 192/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4153  
Epoch 193/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.4191  
Epoch 198/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3963

Epoch 199/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4080  
Epoch 200/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4032  
Epoch 201/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4268  
Epoch 202/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3954  
Epoch 203/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.4315  
Epoch 207/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.4124  
Epoch 211/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.4036  
Epoch 215/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.4194  
Epoch 219/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 1ms/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 2ms/step - loss: 0.3954  
Epoch 238/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4168  
Epoch 239/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4049  
Epoch 240/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.3888  
Epoch 244/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 3ms/step - loss: 0.4036  
Epoch 253/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4020  
Epoch 258/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4000  
Epoch 262/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3787

Epoch 271/1000  
13/13 [=====] - 0s 2ms/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 3ms/step - loss: 0.3776  
Epoch 275/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 3ms/step - loss: 0.3876  
Epoch 284/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3915  
Epoch 288/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.3911  
Epoch 292/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3697  
Epoch 293/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3800  
Epoch 294/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4007



Epoch 295/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4066  
Epoch 296/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3926  
Epoch 300/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4250  
Epoch 301/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3804  
Epoch 305/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3879  
Epoch 309/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3801  
Epoch 310/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3715  
Epoch 311/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3690  
Epoch 312/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3733  
Epoch 313/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3863  
Epoch 314/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3843  
Epoch 315/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3822  
Epoch 316/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3789  
Epoch 317/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3808  
Epoch 318/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3742

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Epoch 319/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3791
Epoch 320/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3836
Epoch 321/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3935
Epoch 322/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3927
Epoch 323/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4023
Epoch 324/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3807
Epoch 328/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3715
Epoch 332/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3933
Epoch 336/1000
13/13 [=====] - 0s 3ms/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 3ms/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

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Epoch 343/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3693  
Epoch 344/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3644  
Epoch 345/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3633  
Epoch 346/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3662  
Epoch 347/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3888  
Epoch 348/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4182  
Epoch 349/1000  
13/13 [=====] - 0s 2ms/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 3ms/step - loss: 0.3757  
Epoch 354/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 3ms/step - loss: 0.3991
Epoch 370/1000
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3791
Epoch 374/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3565
Epoch 375/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3797
Epoch 376/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3772
Epoch 377/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3616
Epoch 378/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3748
Epoch 379/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3832
Epoch 380/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3814
Epoch 381/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4119
Epoch 382/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3712
Epoch 383/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3780
Epoch 384/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3642
Epoch 385/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3681
Epoch 386/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3574
Epoch 387/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3764
Epoch 388/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3717
Epoch 389/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3674
Epoch 390/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3531

```

Epoch 391/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3635  
Epoch 395/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3771  
Epoch 399/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3753  
Epoch 400/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3727  
Epoch 401/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3584  
Epoch 402/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3613  
Epoch 403/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3600  
Epoch 404/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3617  
Epoch 405/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3545  
Epoch 406/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3600  
Epoch 407/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3698  
Epoch 408/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3630  
Epoch 409/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3818  
Epoch 410/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3842  
Epoch 411/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3936  
Epoch 412/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3794  
Epoch 413/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3626  
Epoch 414/1000  
13/13 [=====] - 0s 3ms/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 1ms/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 1ms/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 1ms/step - loss: 0.3682  
Epoch 426/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3655  
Epoch 427/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3641  
Epoch 428/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3707  
Epoch 429/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3673  
Epoch 430/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3631  
Epoch 431/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3523  
Epoch 432/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3592  
Epoch 433/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3893  
Epoch 434/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3961  
Epoch 435/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4097  
Epoch 436/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3961  
Epoch 437/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3837  
Epoch 438/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.3807  
Epoch 443/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3725  
Epoch 444/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3685  
Epoch 448/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3492  
Epoch 452/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 1ms/step - loss: 0.3624  
Epoch 461/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3718  
Epoch 465/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3495  
Epoch 466/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3765  
Epoch 467/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3667  
Epoch 468/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4002  
Epoch 469/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4147  
Epoch 470/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.4088  
Epoch 474/1000  
13/13 [=====] - 0s 3ms/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 1ms/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 1ms/step - loss: 0.3564



Epoch 487/1000  
13/13 [=====] - 0s 3ms/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 1ms/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 1ms/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 3ms/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 2ms/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 1ms/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 3ms/step - loss: 0.3475  
Epoch 522/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 1ms/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 2ms/step - loss: 0.3746  
Epoch 543/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3709  
Epoch 544/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3576  
Epoch 545/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3510  
Epoch 546/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3669  
Epoch 547/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3648  
Epoch 548/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3460  
Epoch 552/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3460  
Epoch 553/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3396  
Epoch 554/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3513  
Epoch 555/1000  
13/13 [=====] - 0s 2ms/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 1ms/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 1ms/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 3ms/step - loss: 0.3493  
Epoch 569/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3514  
Epoch 573/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3557  
Epoch 578/1000  
13/13 [=====] - 0s 2ms/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 3ms/step - loss: 0.3628  
Epoch 582/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3540

Epoch 583/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3571  
Epoch 584/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3818  
Epoch 585/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3954  
Epoch 586/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3348  
Epoch 590/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3374  
Epoch 591/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3489  
Epoch 592/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3452  
Epoch 593/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3429  
Epoch 594/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3425  
Epoch 595/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4209  
Epoch 596/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3978  
Epoch 597/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3529  
Epoch 601/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3345  
Epoch 602/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3436  
Epoch 603/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3594  
Epoch 604/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3504  
Epoch 605/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3590  
Epoch 606/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3738

Epoch 607/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3654  
Epoch 608/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3516  
Epoch 609/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3480  
Epoch 610/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3593  
Epoch 614/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3483  
Epoch 615/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3536  
Epoch 616/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3456  
Epoch 617/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3287  
Epoch 618/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 3ms/step - loss: 0.3774

Epoch 631/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3697  
Epoch 632/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3777  
Epoch 633/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3753  
Epoch 634/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3749  
Epoch 635/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 3ms/step - loss: 0.3642  
Epoch 644/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3561  
Epoch 648/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.3430  
Epoch 659/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3480  
Epoch 660/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3667  
Epoch 661/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3403  
Epoch 662/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3545  
Epoch 663/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3889  
Epoch 664/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3568  
Epoch 665/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3299  
Epoch 669/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 3ms/step - loss: 0.3369  
Epoch 678/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3549  
Epoch 682/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3470  
Epoch 686/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 3ms/step - loss: 0.3517  
Epoch 699/1000  
13/13 [=====] - 0s 1ms/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 3ms/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 3ms/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 3ms/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 2ms/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 1ms/step - loss: 0.3688  
Epoch 724/1000  
13/13 [=====] - 0s 3ms/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

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Epoch 727/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3512
Epoch 728/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3524
Epoch 729/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3441
Epoch 730/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3547
Epoch 731/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3466
Epoch 732/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3520
Epoch 736/1000
13/13 [=====] - 0s 3ms/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 1ms/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 1ms/step - loss: 0.3318
Epoch 745/1000
13/13 [=====] - 0s 3ms/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 1ms/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

```

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Epoch 751/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3599
Epoch 752/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4169
Epoch 753/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4063
Epoch 754/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3516
Epoch 755/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3407
Epoch 756/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3493
Epoch 757/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3608
Epoch 758/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3780
Epoch 759/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3424
Epoch 760/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3436
Epoch 761/1000
13/13 [=====] - 0s 1ms/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 1ms/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 3ms/step - loss: 0.3339
Epoch 768/1000
13/13 [=====] - 0s 1ms/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 1ms/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

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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 1ms/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 3ms/step - loss: 0.3435  
Epoch 781/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3298  
Epoch 785/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.3315  
Epoch 798/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 1ms/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 1ms/step - loss: 0.3443  
Epoch 816/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3452  
Epoch 817/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3625  
Epoch 818/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3543  
Epoch 819/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3472

Epoch 823/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 1ms/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 3ms/step - loss: 0.3268  
Epoch 840/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3570  
Epoch 848/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3441  
Epoch 849/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3220  
Epoch 850/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3376  
Epoch 851/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3364  
Epoch 852/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 3ms/step - loss: 0.3459  
Epoch 861/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3653  
Epoch 862/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3272  
Epoch 863/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3222  
Epoch 864/1000  
13/13 [=====] - 0s 3ms/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 1ms/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 1ms/step - loss: 0.3410  
Epoch 873/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3373  
Epoch 874/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3479  
Epoch 875/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3524  
Epoch 876/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3360  
Epoch 877/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3270  
Epoch 881/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 1ms/step - loss: 0.3373  
Epoch 890/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3340  
Epoch 894/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 1ms/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 1ms/step - loss: 0.3571  
Epoch 907/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3797  
Epoch 911/1000  
13/13 [=====] - 0s 3ms/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 1ms/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 1ms/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 1ms/step - loss: 0.3225  
Epoch 924/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3434  
Epoch 928/1000  
13/13 [=====] - 0s 3ms/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 1ms/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 1ms/step - loss: 0.3342  
Epoch 937/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3407  
Epoch 941/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3599  
Epoch 945/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 1ms/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 1ms/step - loss: 0.3319  
Epoch 958/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3494  
Epoch 972/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3260  
Epoch 973/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3279  
Epoch 974/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3238  
Epoch 975/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3174  
Epoch 984/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3248  
Epoch 988/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3422
Epoch 992/1000
13/13 [=====] - 0s 1ms/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 1ms/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 3ms/step - loss: 0.3514

```

[82]: <keras.callbacks.History at 0x7b7eace05510>

```

[83]: # BEGIN UNIT TEST
model_r.summary()

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

```

Model: "sequential\_8"

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

```

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

```
tf.random.set_seed(1234)
model_r = Sequential(
    [
        Dense(120, activation = 'relu', kernel_regularizer=tf.keras.regularizers.l2(0.1), name='L1'),
        Dense(40, activation = 'relu', kernel_regularizer=tf.keras.regularizers.l2(0.1), name='L2'),
        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
)
```

```
[84]: #make a model for plotting routines to call
model_predict_r = lambda X1: np.argmax(tf.nn.softmax(model_r.predict(X1)).
    ↪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', 'B

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

```
[85]: 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}" )
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!

```
[46]: 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 2ms/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 3ms/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 3ms/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 2ms/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 2ms/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 2ms/step - loss: 0.2000  
Epoch 27/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.2424  
Epoch 31/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.2074  
Epoch 36/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.1955  
Epoch 40/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1870  
Epoch 41/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.2073  
Epoch 45/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2148  
Epoch 46/1000  
13/13 [=====] - 0s 1ms/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 2ms/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 2ms/step - loss: 0.2035  
Epoch 54/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1761  
Epoch 55/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.1630  
Epoch 63/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.2092  
Epoch 68/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 1ms/step - loss: 0.1696  
Epoch 76/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1542  
Epoch 77/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1715  
Epoch 78/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1545  
Epoch 79/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1593  
Epoch 80/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1844  
Epoch 81/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1881  
Epoch 82/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1696  
Epoch 83/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1614  
Epoch 84/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.1614  
Epoch 88/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1639  
Epoch 89/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1629  
Epoch 90/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1475  
Epoch 91/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1452  
Epoch 92/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1473  
Epoch 93/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1490  
Epoch 94/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1650  
Epoch 95/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1855
Epoch 99/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1737
Epoch 103/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1935
Epoch 104/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1600
Epoch 105/1000
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.1435
Epoch 109/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1419
Epoch 110/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1494
Epoch 111/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1538
Epoch 112/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1682
Epoch 113/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1687
Epoch 114/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1436
Epoch 115/1000
13/13 [=====] - 0s 2ms/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 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 2ms/step - loss: 0.1465  
Epoch 122/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1549  
Epoch 123/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1402  
Epoch 124/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.1319  
Epoch 128/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.1244  
Epoch 133/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1260  
Epoch 134/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.1294  
Epoch 138/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.1232  
Epoch 142/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1199  
Epoch 143/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.1477  
Epoch 147/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.1292  
Epoch 151/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1316  
Epoch 155/1000  
13/13 [=====] - 0s 1ms/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 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 2ms/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 2ms/step - loss: 0.1205  
Epoch 168/1000  
13/13 [=====] - 0s 1ms/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 2ms/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 2ms/step - loss: 0.1134  
Epoch 177/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.1040  
Epoch 183/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1155  
Epoch 184/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1049  
Epoch 185/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1111  
Epoch 186/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.0971  
Epoch 190/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0985  
Epoch 191/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1006
Epoch 197/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0974
Epoch 198/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1141
Epoch 199/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1423
Epoch 200/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1381
Epoch 201/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1105
Epoch 202/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1005
Epoch 203/1000
13/13 [=====] - 0s 2ms/step - loss: 0.0846
Epoch 204/1000
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.1137
Epoch 209/1000
13/13 [=====] - 0s 1ms/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 3ms/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 1ms/step - loss: 0.1047
Epoch 216/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1044
Epoch 217/1000

```

13/13 [=====] - 0s 2ms/step - loss: 0.1044  
Epoch 218/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1006  
Epoch 219/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1093  
Epoch 220/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1041  
Epoch 221/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.1000  
Epoch 225/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0968  
Epoch 226/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0951  
Epoch 227/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1092  
Epoch 228/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1041  
Epoch 229/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0978  
Epoch 233/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1074  
Epoch 234/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1059  
Epoch 235/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 3ms/step - loss: 0.0837  
Epoch 244/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0866  
Epoch 245/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0933  
Epoch 246/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0976  
Epoch 247/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1150  
Epoch 248/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0904  
Epoch 249/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1073  
Epoch 250/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1296  
Epoch 251/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1022  
Epoch 252/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.0924  
Epoch 256/1000  
13/13 [=====] - 0s 3ms/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 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 1ms/step - loss: 0.0780  
Epoch 263/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0821  
Epoch 264/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0795  
Epoch 265/1000

13/13 [=====] - 0s 3ms/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  
13/13 [=====] - 0s 2ms/step - loss: 0.0720  
Epoch 269/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.0984  
Epoch 273/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/step - loss: 0.0631  
Epoch 286/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.0682  
Epoch 291/1000  
13/13 [=====] - 0s 2ms/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 3ms/step - loss: 0.0741  
Epoch 296/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 1ms/step - loss: 0.0718  
Epoch 303/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0877  
Epoch 304/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0687  
Epoch 305/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.0779  
Epoch 309/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0696  
Epoch 310/1000  
13/13 [=====] - 0s 1ms/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

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13/13 [=====] - 0s 3ms/step - loss: 0.0603
Epoch 314/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0772
Epoch 315/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0660
Epoch 316/1000
13/13 [=====] - 0s 2ms/step - loss: 0.0586
Epoch 317/1000
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.0598
Epoch 321/1000
13/13 [=====] - 0s 3ms/step - loss: 0.0670
Epoch 322/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.0837
Epoch 326/1000
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.0691
Epoch 330/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0593
Epoch 334/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0606
Epoch 335/1000
13/13 [=====] - 0s 2ms/step - loss: 0.0696
Epoch 336/1000
13/13 [=====] - 0s 2ms/step - loss: 0.0713
Epoch 337/1000

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13/13 [=====] - 0s 2ms/step - loss: 0.0628  
Epoch 338/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0752  
Epoch 339/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0723  
Epoch 340/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0647  
Epoch 341/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0688  
Epoch 342/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0793  
Epoch 343/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0595  
Epoch 344/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0528  
Epoch 345/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0552  
Epoch 346/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0534  
Epoch 347/1000  
13/13 [=====] - 0s 2ms/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 3ms/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 2ms/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 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 1ms/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 2ms/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 2ms/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 2ms/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 2ms/step - loss: 0.0461  
Epoch 381/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.0479  
Epoch 385/1000



13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.0525  
Epoch 390/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0666  
Epoch 391/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0490  
Epoch 392/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0551  
Epoch 393/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0689  
Epoch 394/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0663  
Epoch 395/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0844  
Epoch 396/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.0586  
Epoch 400/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0628  
Epoch 401/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1717  
Epoch 402/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1648  
Epoch 403/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1616  
Epoch 404/1000  
13/13 [=====] - 0s 1ms/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 2ms/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 2ms/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 2ms/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 2ms/step - loss: 0.0573  
Epoch 420/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0721  
Epoch 421/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.0647  
Epoch 425/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0465  
Epoch 426/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0435  
Epoch 427/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0362  
Epoch 428/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0411  
Epoch 429/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 1ms/step - loss: 0.0420  
Epoch 437/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0347  
Epoch 438/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0390  
Epoch 439/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0328  
Epoch 440/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0371  
Epoch 441/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.0408  
Epoch 445/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0329  
Epoch 446/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.0346  
Epoch 450/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 1ms/step - loss: 0.0468  
Epoch 459/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.0284  
Epoch 463/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0310  
Epoch 464/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/step - loss: 0.0369  
Epoch 471/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0436  
Epoch 472/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0543  
Epoch 473/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0477  
Epoch 474/1000  
13/13 [=====] - 0s 2ms/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 3ms/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 3ms/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 2ms/step - loss: 0.0651
Epoch 488/1000
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/step - loss: 0.0805
Epoch 498/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0639
Epoch 499/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0504
Epoch 500/1000
13/13 [=====] - 0s 2ms/step - loss: 0.0478
Epoch 501/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.0352
Epoch 505/1000

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13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.0317  
Epoch 509/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0318  
Epoch 510/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0364  
Epoch 511/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0337  
Epoch 512/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0290  
Epoch 513/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0317  
Epoch 514/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0320  
Epoch 515/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0271  
Epoch 516/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0343  
Epoch 517/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0308  
Epoch 518/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0388  
Epoch 519/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0444  
Epoch 520/1000  
13/13 [=====] - 0s 2ms/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 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 3ms/step - loss: 0.0365  
Epoch 527/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0351  
Epoch 528/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0305  
Epoch 529/1000

13/13 [=====] - 0s 2ms/step - loss: 0.0320  
 Epoch 530/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.0351  
 Epoch 531/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.0290  
 Epoch 532/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.0329  
 Epoch 533/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.0387  
 Epoch 534/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.0431  
 Epoch 535/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.0414  
 Epoch 536/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.0318  
 Epoch 537/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.0285  
 Epoch 538/1000  
 13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.0278  
 Epoch 546/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.0256  
 Epoch 547/1000  
 13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.0288  
 Epoch 551/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.0283  
 Epoch 552/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.0315  
 Epoch 553/1000

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13/13 [=====] - 0s 1ms/step - loss: 0.0411
Epoch 554/1000
13/13 [=====] - 0s 2ms/step - loss: 0.0376
Epoch 555/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0346
Epoch 556/1000
13/13 [=====] - 0s 3ms/step - loss: 0.0296
Epoch 557/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0307
Epoch 558/1000
13/13 [=====] - 0s 2ms/step - loss: 0.0270
Epoch 559/1000
13/13 [=====] - 0s 2ms/step - loss: 0.0268
Epoch 560/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.0249
Epoch 564/1000
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.1035
Epoch 572/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1415
Epoch 573/1000
13/13 [=====] - 0s 1ms/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

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13/13 [=====] - 0s 2ms/step - loss: 0.0770  
Epoch 578/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0637  
Epoch 579/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0528  
Epoch 580/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0371  
Epoch 581/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0356  
Epoch 582/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.0307  
Epoch 586/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0321  
Epoch 587/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0266  
Epoch 588/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.0305  
Epoch 592/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0278  
Epoch 593/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0343  
Epoch 594/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0259  
Epoch 595/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0259  
Epoch 596/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0258  
Epoch 597/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0262  
Epoch 598/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0254  
Epoch 599/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0251  
Epoch 600/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0241  
Epoch 601/1000

13/13 [=====] - 0s 2ms/step - loss: 0.0269  
Epoch 602/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0287  
Epoch 603/1000  
13/13 [=====] - 0s 2ms/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 3ms/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 1ms/step - loss: 0.0237  
Epoch 610/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0253  
Epoch 611/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 2ms/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 1ms/step - loss: 0.1078  
Epoch 624/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.0333  
Epoch 628/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.0235  
Epoch 635/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.0223  
Epoch 639/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0215  
Epoch 640/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.0277  
Epoch 645/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0266  
Epoch 646/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0320  
Epoch 647/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0269  
Epoch 648/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0357  
Epoch 649/1000

13/13 [=====] - 0s 3ms/step - loss: 0.0321  
Epoch 650/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0255  
Epoch 651/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0287  
Epoch 652/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0251  
Epoch 653/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0242  
Epoch 654/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.0247  
Epoch 658/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0246  
Epoch 662/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 1ms/step - loss: 0.0441  
Epoch 670/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0305  
Epoch 671/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0323  
Epoch 672/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0356  
Epoch 673/1000

13/13 [=====] - 0s 1ms/step - loss: 0.0670  
Epoch 674/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1732  
Epoch 675/1000  
13/13 [=====] - 0s 3ms/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 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 1ms/step - loss: 0.1123  
Epoch 682/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1581  
Epoch 683/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1343  
Epoch 684/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.1218  
Epoch 688/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.0665  
Epoch 692/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.0411  
Epoch 697/1000

13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.0311  
Epoch 701/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.0282  
Epoch 706/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.0252  
Epoch 711/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.0265  
Epoch 715/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/step - loss: 0.0238  
Epoch 727/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0234  
Epoch 728/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0223  
Epoch 729/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0220  
Epoch 730/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0268  
Epoch 731/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0363  
Epoch 732/1000  
13/13 [=====] - 0s 1ms/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 2ms/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 2ms/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 2ms/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 2ms/step - loss: 0.0193  
Epoch 748/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0203  
Epoch 752/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0194  
Epoch 753/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0252  
Epoch 754/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0203  
Epoch 755/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0206  
Epoch 756/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0192  
Epoch 757/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0213  
Epoch 758/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0206  
Epoch 759/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0247  
Epoch 760/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0227  
Epoch 761/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 2ms/step - loss: 0.1082  
Epoch 769/1000



13/13 [=====] - 0s 1ms/step - loss: 0.0924  
 Epoch 770/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.0936  
 Epoch 771/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.0690  
 Epoch 772/1000  
 13/13 [=====] - 0s 2ms/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 1ms/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 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 1ms/step - loss: 0.0789  
 Epoch 785/1000  
 13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.0329  
 Epoch 790/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.0291  
 Epoch 791/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.0283  
 Epoch 792/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.0291  
 Epoch 793/1000

13/13 [=====] - 0s 2ms/step - loss: 0.0261  
Epoch 794/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 2ms/step - loss: 0.0371  
Epoch 802/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.0260  
Epoch 806/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0254  
Epoch 807/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0258  
Epoch 808/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0252  
Epoch 809/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0280  
Epoch 810/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0249  
Epoch 811/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.0258  
Epoch 815/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0246  
Epoch 816/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0263  
Epoch 817/1000

13/13 [=====] - 0s 1ms/step - loss: 0.0328  
Epoch 818/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.0256  
Epoch 823/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0299  
Epoch 824/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.0247  
Epoch 828/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.0259  
Epoch 832/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.0253  
Epoch 837/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.0286  
Epoch 841/1000

13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0219  
Epoch 850/1000  
13/13 [=====] - 0s 3ms/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 1ms/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 1ms/step - loss: 0.0252  
Epoch 859/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/step - loss: 0.0273  
Epoch 867/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0271  
Epoch 868/1000  
13/13 [=====] - 0s 1ms/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 2ms/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 2ms/step - loss: 0.0218  
Epoch 876/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0217  
Epoch 877/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 2ms/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 2ms/step - loss: 0.0294  
Epoch 889/1000

13/13 [=====] - 0s 3ms/step - loss: 0.0283  
Epoch 890/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0240  
Epoch 891/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0232  
Epoch 892/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0225  
Epoch 893/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.0196  
Epoch 894/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0218  
Epoch 895/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0189  
Epoch 896/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0221  
Epoch 897/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0204  
Epoch 898/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.0199  
Epoch 902/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.0272  
Epoch 906/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.0189  
Epoch 910/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.1883  
 Epoch 914/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2096  
 Epoch 915/1000  
 13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.0621  
 Epoch 919/1000  
 13/13 [=====] - 0s 2ms/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 2ms/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 2ms/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 2ms/step - loss: 0.0332  
 Epoch 932/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.0322  
 Epoch 933/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.0311  
 Epoch 934/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.0493  
 Epoch 935/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.0289  
 Epoch 936/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.0325  
 Epoch 937/1000

13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.0371  
Epoch 942/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.0307  
Epoch 947/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0376  
Epoch 948/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0375  
Epoch 949/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.0350  
Epoch 950/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0284  
Epoch 951/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.0293  
Epoch 952/1000  
13/13 [=====] - 0s 2ms/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 1ms/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 3ms/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 1ms/step - loss: 0.0203  
Epoch 962/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 2ms/step - loss: 0.0200  
Epoch 970/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.0161  
Epoch 975/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.0234  
Epoch 979/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 1ms/step - loss: 0.0287
Epoch 988/1000
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.0199
Epoch 996/1000
13/13 [=====] - 0s 1ms/step - loss: 0.0231
Epoch 997/1000
13/13 [=====] - 0s 1ms/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 2ms/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 1ms/step - loss: 0.4067
Epoch 4/1000
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.3211
Epoch 8/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2734  
Epoch 12/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3013  
Epoch 16/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 1ms/step - loss: 0.2539  
Epoch 25/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2504  
Epoch 29/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.2664  
Epoch 36/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2432  
Epoch 37/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2508  
Epoch 38/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2304  
Epoch 39/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2398  
Epoch 40/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2355  
Epoch 41/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2703  
Epoch 42/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2665  
Epoch 43/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2429  
Epoch 44/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2581  
Epoch 45/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2825  
Epoch 46/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2437  
Epoch 47/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2321  
Epoch 48/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2325  
Epoch 49/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2283  
Epoch 50/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2255  
Epoch 51/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2451  
Epoch 52/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2366  
Epoch 53/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2477  
Epoch 54/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2280  
Epoch 55/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2741  
Epoch 56/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2435

Epoch 57/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 1ms/step - loss: 0.2697  
Epoch 65/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2643  
Epoch 66/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2394  
Epoch 70/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2550  
Epoch 74/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/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 2ms/step - loss: 0.2536  
Epoch 86/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2255  
Epoch 87/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 2ms/step - loss: 0.2176  
Epoch 95/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2427  
Epoch 96/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2451  
Epoch 97/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2428  
Epoch 98/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2501  
Epoch 99/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2412  
Epoch 100/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2254  
Epoch 101/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2411  
Epoch 102/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2359  
Epoch 103/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2533  
Epoch 104/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2353

Epoch 105/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2218  
Epoch 106/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2232  
Epoch 107/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2330  
Epoch 108/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2145  
Epoch 109/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 3ms/step - loss: 0.2254  
Epoch 117/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.2160  
Epoch 121/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2220  
Epoch 122/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2230  
Epoch 123/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2187  
Epoch 124/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2099  
Epoch 125/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2094  
Epoch 126/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2328  
Epoch 127/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2216  
Epoch 128/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2138

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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 2ms/step - loss: 0.2217
Epoch 132/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2124
Epoch 136/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2100
Epoch 137/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2188
Epoch 138/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2184
Epoch 139/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2081
Epoch 140/1000
13/13 [=====] - 0s 1ms/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 2ms/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 1ms/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 3ms/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 2ms/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 2ms/step - loss: 0.2202  
Epoch 165/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2135  
Epoch 166/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2072  
Epoch 167/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2135  
Epoch 168/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2180  
Epoch 169/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2160  
Epoch 170/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2288  
Epoch 171/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2118  
Epoch 172/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2039  
Epoch 173/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2185  
Epoch 174/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2109  
Epoch 175/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1978  
Epoch 176/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2058

Epoch 177/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2035  
Epoch 178/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2134  
Epoch 179/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2120  
Epoch 180/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2032  
Epoch 181/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2208  
Epoch 182/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2110  
Epoch 183/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.1989  
Epoch 187/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2045  
Epoch 188/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2013  
Epoch 189/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2033  
Epoch 190/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2129  
Epoch 191/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2110  
Epoch 192/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2040  
Epoch 193/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2081  
Epoch 194/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2046  
Epoch 195/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1934  
Epoch 196/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1943  
Epoch 197/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2082  
Epoch 198/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2047  
Epoch 199/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2199  
Epoch 200/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2055

```

Epoch 201/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1974
Epoch 202/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1992
Epoch 203/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1944
Epoch 204/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2274
Epoch 205/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1976
Epoch 206/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1989
Epoch 207/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2099
Epoch 208/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2115
Epoch 209/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1963
Epoch 210/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2017
Epoch 211/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2062
Epoch 212/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2089
Epoch 213/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2148
Epoch 214/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2068
Epoch 215/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2078
Epoch 216/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2014
Epoch 217/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2152
Epoch 218/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2124
Epoch 219/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2030
Epoch 220/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2046
Epoch 221/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1955
Epoch 222/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1952
Epoch 223/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2066
Epoch 224/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2206

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Epoch 225/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2010  
Epoch 226/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1978  
Epoch 227/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1886  
Epoch 228/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1925  
Epoch 229/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1953  
Epoch 230/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2075  
Epoch 231/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2373  
Epoch 232/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.2008  
Epoch 236/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.2126  
Epoch 244/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/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 2ms/step - loss: 0.1996  
Epoch 256/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1887  
Epoch 257/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2110  
Epoch 258/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2040  
Epoch 259/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1890  
Epoch 260/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1960  
Epoch 261/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2038  
Epoch 262/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1948  
Epoch 263/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1931  
Epoch 264/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1913  
Epoch 265/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1912  
Epoch 266/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1895  
Epoch 267/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1990  
Epoch 268/1000  
13/13 [=====] - 0s 1ms/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 2ms/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 2ms/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 2ms/step - loss: 0.1988  
Epoch 284/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1857  
Epoch 285/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1860  
Epoch 286/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1946  
Epoch 287/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.1901  
Epoch 292/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1820  
Epoch 293/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1869  
Epoch 294/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1866  
Epoch 295/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1950  
Epoch 296/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1952

Epoch 297/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1884  
 Epoch 298/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2042  
 Epoch 299/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1900  
 Epoch 300/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1985  
 Epoch 301/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2013  
 Epoch 302/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2040  
 Epoch 303/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.2127  
 Epoch 304/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1954  
 Epoch 305/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1994  
 Epoch 306/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1881  
 Epoch 307/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1973  
 Epoch 308/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1940  
 Epoch 309/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1895  
 Epoch 310/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1879  
 Epoch 311/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1832  
 Epoch 312/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1879  
 Epoch 313/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1920  
 Epoch 314/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1844  
 Epoch 315/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1927  
 Epoch 316/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1871  
 Epoch 317/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1866  
 Epoch 318/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2143  
 Epoch 319/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1956  
 Epoch 320/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1846

Epoch 321/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1823  
 Epoch 322/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1892  
 Epoch 323/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.2019  
 Epoch 324/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1810  
 Epoch 325/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1885  
 Epoch 326/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1797  
 Epoch 327/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1900  
 Epoch 328/1000  
 13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.1923  
 Epoch 332/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1922  
 Epoch 333/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1962  
 Epoch 334/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2092  
 Epoch 335/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.2044  
 Epoch 336/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1936  
 Epoch 337/1000  
 13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1932  
 Epoch 341/1000  
 13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1793



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Epoch 345/1000
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/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 2ms/step - loss: 0.1957
Epoch 356/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1822
Epoch 357/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1815
Epoch 358/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1859
Epoch 359/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1802
Epoch 360/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1887
Epoch 361/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1910
Epoch 365/1000
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.1756

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Epoch 369/1000  
 13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1778  
 Epoch 373/1000  
 13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.1849  
 Epoch 380/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1833  
 Epoch 381/1000  
 13/13 [=====] - 0s 1ms/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 1ms/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 1ms/step - loss: 0.1775  
 Epoch 389/1000  
 13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1833

Epoch 393/1000  
 13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1841  
 Epoch 397/1000  
 13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.1781  
 Epoch 405/1000  
 13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1797  
 Epoch 409/1000  
 13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1850  
 Epoch 413/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1878  
 Epoch 414/1000  
 13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.1852  
 Epoch 418/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1756  
 Epoch 419/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1730  
 Epoch 420/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1734  
 Epoch 421/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1806  
 Epoch 422/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1750  
 Epoch 423/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1810  
 Epoch 424/1000  
 13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1719  
 Epoch 428/1000  
 13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1739  
 Epoch 432/1000  
 13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1819  
 Epoch 436/1000  
 13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1701  
 Epoch 440/1000  
 13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1800
Epoch 444/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1883
Epoch 448/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1819
Epoch 452/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1744
Epoch 456/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1799
Epoch 460/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1777
Epoch 464/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1802

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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 2ms/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 2ms/step - loss: 0.1833  
Epoch 472/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1811  
Epoch 476/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.1784  
Epoch 484/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1865  
Epoch 485/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1801  
Epoch 486/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1695  
Epoch 487/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/step - loss: 0.1732
Epoch 496/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1892
Epoch 497/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1761
Epoch 498/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1763
Epoch 499/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1737
Epoch 500/1000
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/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 2ms/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 1ms/step - loss: 0.1735  
Epoch 521/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1882  
Epoch 522/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/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 1ms/step - loss: 0.1869  
Epoch 542/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1679  
Epoch 543/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/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 2ms/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 2ms/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 2ms/step - loss: 0.1692  
Epoch 567/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1792  
Epoch 568/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1907  
Epoch 569/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1717  
Epoch 570/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 1ms/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 2ms/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 2ms/step - loss: 0.1651  
Epoch 587/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1687  
Epoch 588/1000  
13/13 [=====] - 0s 1ms/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 3ms/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 2ms/step - loss: 0.1660  
Epoch 595/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1688  
Epoch 596/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1687  
Epoch 597/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1634  
Epoch 598/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1754  
Epoch 599/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.1666  
Epoch 603/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1624  
Epoch 607/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1728  
Epoch 611/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1716  
Epoch 615/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1690  
Epoch 619/1000  
13/13 [=====] - 0s 3ms/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 1ms/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 1ms/step - loss: 0.1685  
Epoch 627/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1638  
Epoch 628/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1630  
Epoch 629/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1606  
Epoch 630/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1633  
Epoch 631/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1651  
Epoch 632/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1616

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Epoch 633/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1572
Epoch 634/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1576
Epoch 635/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1818
Epoch 639/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1644
Epoch 643/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1672
Epoch 647/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1631
Epoch 648/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1641
Epoch 649/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1597
Epoch 650/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1691
Epoch 651/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1637
Epoch 652/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1590
Epoch 653/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1591
Epoch 654/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1654
Epoch 655/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1628
Epoch 656/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1575

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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 3ms/step - loss: 0.1640  
Epoch 660/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1630  
Epoch 661/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1638  
Epoch 662/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1606  
Epoch 663/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1622  
Epoch 664/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1666  
Epoch 665/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1570  
Epoch 666/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1608  
Epoch 667/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1652  
Epoch 668/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1617  
Epoch 669/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1643  
Epoch 670/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 1ms/step - loss: 0.1623  
Epoch 678/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.1790  
Epoch 682/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.1788  
Epoch 686/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1874  
Epoch 687/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1708  
Epoch 688/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1683  
Epoch 689/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1634  
Epoch 690/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1617  
Epoch 691/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1640  
Epoch 692/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1608  
Epoch 693/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1657  
Epoch 694/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1631  
Epoch 695/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1630  
Epoch 696/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1552  
Epoch 697/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1622  
Epoch 698/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1611  
Epoch 699/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1574  
Epoch 700/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1555  
Epoch 701/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1579  
Epoch 702/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1627  
Epoch 703/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1560  
Epoch 704/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1624

Epoch 705/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1583  
Epoch 706/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1563  
Epoch 707/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1612  
Epoch 708/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1604  
Epoch 709/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1750  
Epoch 710/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1753  
Epoch 711/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1708  
Epoch 712/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1668  
Epoch 713/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1671  
Epoch 714/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1543  
Epoch 715/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1748  
Epoch 716/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.1602  
Epoch 720/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1585  
Epoch 721/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1671  
Epoch 722/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1553  
Epoch 723/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1588  
Epoch 724/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1534  
Epoch 725/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1654  
Epoch 726/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1566  
Epoch 727/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1590  
Epoch 728/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1607



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Epoch 729/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1564
Epoch 730/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1612
Epoch 731/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1658
Epoch 732/1000
13/13 [=====] - 0s 1ms/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 1ms/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 1ms/step - loss: 0.1832
Epoch 740/1000
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.1575
Epoch 744/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.1647
Epoch 748/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1577
Epoch 752/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1612

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Epoch 753/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1570
Epoch 754/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1626
Epoch 755/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1578
Epoch 756/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1551
Epoch 757/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1586
Epoch 758/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1532
Epoch 759/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1551
Epoch 763/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1609
Epoch 767/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1537
Epoch 771/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1720
Epoch 775/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1543
Epoch 779/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1557
Epoch 783/1000
13/13 [=====] - 0s 3ms/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 1ms/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 1ms/step - loss: 0.1545
Epoch 791/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1577
Epoch 792/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1562
Epoch 793/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1554
Epoch 794/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1573
Epoch 795/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1554
Epoch 796/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1542
Epoch 797/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1676
Epoch 798/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1574
Epoch 799/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1515
Epoch 800/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1504

```

Epoch 801/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1536  
Epoch 802/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1520  
Epoch 806/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1538  
Epoch 807/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1547  
Epoch 808/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1503  
Epoch 809/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1535  
Epoch 810/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1703  
Epoch 811/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1708  
Epoch 812/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1572  
Epoch 813/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1517  
Epoch 814/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1531  
Epoch 815/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1550  
Epoch 816/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1579  
Epoch 817/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1608  
Epoch 818/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1555  
Epoch 819/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1793  
Epoch 820/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1690  
Epoch 821/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.1757

Epoch 825/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1684  
 Epoch 826/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1590  
 Epoch 827/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1590  
 Epoch 828/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1637  
 Epoch 829/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1608  
 Epoch 830/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1513  
 Epoch 831/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1630  
 Epoch 832/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1555  
 Epoch 833/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1585  
 Epoch 834/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1480  
 Epoch 835/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1504  
 Epoch 836/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1528  
 Epoch 837/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1586  
 Epoch 838/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1555  
 Epoch 839/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1596  
 Epoch 840/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1552  
 Epoch 841/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1612  
 Epoch 842/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1690  
 Epoch 843/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1602  
 Epoch 844/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1541  
 Epoch 845/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1550  
 Epoch 846/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.1606  
 Epoch 847/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.1592  
 Epoch 848/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.1574

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Epoch 849/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1516
Epoch 850/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1509
Epoch 851/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1519
Epoch 852/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1667
Epoch 853/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1508
Epoch 854/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1507
Epoch 855/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1633
Epoch 856/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1582
Epoch 857/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1661
Epoch 858/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1703
Epoch 859/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1607
Epoch 860/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1603
Epoch 861/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1549
Epoch 862/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1584
Epoch 863/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1518
Epoch 864/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1543
Epoch 865/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1512
Epoch 866/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1637
Epoch 867/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1567
Epoch 868/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1579
Epoch 869/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1508
Epoch 870/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1573
Epoch 871/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1512
Epoch 872/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1483

```

```

Epoch 873/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1507
Epoch 874/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1528
Epoch 875/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1563
Epoch 876/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1574
Epoch 877/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1532
Epoch 878/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1611
Epoch 879/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1620
Epoch 880/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1547
Epoch 881/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1618
Epoch 882/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1671
Epoch 883/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1656
Epoch 884/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1590
Epoch 885/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1662
Epoch 886/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1552
Epoch 887/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1557
Epoch 888/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1603
Epoch 893/1000
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.1528

```

Epoch 897/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1592  
Epoch 898/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1519  
Epoch 899/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1682  
Epoch 900/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1645  
Epoch 901/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1666  
Epoch 902/1000  
13/13 [=====] - 0s 2ms/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 1ms/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 2ms/step - loss: 0.1518  
Epoch 911/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.1474  
Epoch 915/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.1493  
Epoch 919/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1545  
Epoch 923/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1503  
Epoch 927/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1526  
Epoch 931/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.1561  
Epoch 935/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.1599  
Epoch 939/1000  
13/13 [=====] - 0s 3ms/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 1ms/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 1ms/step - loss: 0.1521  
Epoch 946/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1551  
Epoch 947/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1554  
Epoch 948/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1675  
Epoch 949/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1505  
Epoch 950/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1504  
Epoch 951/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1501  
Epoch 952/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1580  
Epoch 953/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1532  
Epoch 958/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1590  
Epoch 959/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1550  
Epoch 960/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1483  
Epoch 961/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1471  
Epoch 962/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1516  
Epoch 963/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1588  
Epoch 964/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1493  
Epoch 965/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.1624

Epoch 969/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1565  
Epoch 970/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1548  
Epoch 971/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.1545  
Epoch 976/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.1494  
Epoch 980/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.1450  
Epoch 985/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1494  
Epoch 986/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1509  
Epoch 987/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1414  
Epoch 988/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.1559  
Epoch 989/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.1550  
Epoch 990/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1503  
Epoch 991/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1496  
Epoch 992/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.1508

```

Epoch 993/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1506
Epoch 994/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1482
Epoch 995/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1551
Epoch 996/1000
13/13 [=====] - 0s 2ms/step - loss: 0.1615
Epoch 997/1000
13/13 [=====] - 0s 3ms/step - loss: 0.1736
Epoch 998/1000
13/13 [=====] - 0s 1ms/step - loss: 0.1754
Epoch 999/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.7947
Epoch 3/1000
13/13 [=====] - 0s 2ms/step - loss: 0.6159
Epoch 4/1000
13/13 [=====] - 0s 3ms/step - loss: 0.5300
Epoch 5/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4991
Epoch 6/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4763
Epoch 7/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4761
Epoch 8/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4651
Epoch 9/1000
13/13 [=====] - 0s 1ms/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 1ms/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 2ms/step - loss: 0.4180  
Epoch 17/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3689  
Epoch 21/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3582  
Epoch 25/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3618  
Epoch 29/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3440  
Epoch 33/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 3ms/step - loss: 0.3507
Epoch 42/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3586
Epoch 43/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3529
Epoch 44/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3379
Epoch 45/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3303
Epoch 46/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3230
Epoch 47/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3333
Epoch 48/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3398
Epoch 49/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3231
Epoch 50/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3151
Epoch 51/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3105
Epoch 52/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.3593
Epoch 56/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3489
Epoch 57/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3277
Epoch 58/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3034
Epoch 59/1000
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3334
Epoch 63/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.3456  
Epoch 68/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3420  
Epoch 69/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3175  
Epoch 70/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3176  
Epoch 71/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3266  
Epoch 72/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2945  
Epoch 73/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3038  
Epoch 74/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3079  
Epoch 75/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3156  
Epoch 76/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3161  
Epoch 77/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3109  
Epoch 78/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3183  
Epoch 79/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.3209  
Epoch 83/1000  
13/13 [=====] - 0s 1ms/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 3ms/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 3ms/step - loss: 0.3095  
Epoch 92/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2903  
Epoch 93/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2827  
Epoch 94/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2945  
Epoch 95/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3167  
Epoch 96/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2846  
Epoch 97/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2896  
Epoch 98/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3049  
Epoch 99/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3257  
Epoch 100/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2916  
Epoch 101/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3189  
Epoch 102/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2933  
Epoch 103/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3247  
Epoch 104/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2951  
Epoch 105/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3002  
Epoch 106/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2824  
Epoch 107/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3384  
Epoch 108/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2741  
Epoch 109/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.2788  
Epoch 114/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2871  
Epoch 115/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2790  
Epoch 116/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2960  
Epoch 117/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2773  
Epoch 118/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2729  
Epoch 119/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2967  
Epoch 120/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3043  
Epoch 121/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2981  
Epoch 122/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2903  
Epoch 123/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2808  
Epoch 124/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2722  
Epoch 125/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.2898  
Epoch 129/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2991  
Epoch 130/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2872  
Epoch 131/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2926  
Epoch 132/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2694  
Epoch 133/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 2ms/step - loss: 0.2971  
Epoch 141/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2962  
Epoch 145/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2684  
Epoch 149/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2700  
Epoch 150/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2771  
Epoch 151/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2724  
Epoch 152/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2769  
Epoch 153/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2793  
Epoch 157/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2646  
Epoch 161/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2655  
Epoch 172/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2590  
Epoch 173/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2792  
Epoch 174/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2796  
Epoch 175/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2747  
Epoch 176/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2658  
Epoch 177/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2601  
Epoch 178/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2806  
Epoch 179/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2803  
Epoch 180/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2601  
Epoch 181/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2837  
Epoch 182/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2661  
Epoch 183/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2565  
Epoch 184/1000

13/13 [=====] - 0s 2ms/step - loss: 0.2792  
Epoch 185/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2663  
Epoch 186/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2869  
Epoch 187/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2754  
Epoch 188/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2606  
Epoch 189/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2567  
Epoch 190/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2627  
Epoch 191/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2783  
Epoch 192/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2639  
Epoch 193/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2750  
Epoch 194/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2751  
Epoch 195/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2665  
Epoch 196/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2544  
Epoch 197/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2694  
Epoch 198/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.2676  
Epoch 202/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2561  
Epoch 203/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2634  
Epoch 204/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2984  
Epoch 205/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2652  
Epoch 206/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2517  
Epoch 207/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2660  
Epoch 208/1000

13/13 [=====] - 0s 2ms/step - loss: 0.2698  
Epoch 209/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2635  
Epoch 210/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2600  
Epoch 211/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2638  
Epoch 212/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2641  
Epoch 213/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2654  
Epoch 214/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2647  
Epoch 215/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2613  
Epoch 216/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2652  
Epoch 217/1000  
13/13 [=====] - 0s 1ms/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 4ms/step - loss: 0.2533  
Epoch 221/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2562  
Epoch 222/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2620  
Epoch 223/1000  
13/13 [=====] - 0s 5ms/step - loss: 0.2624  
Epoch 224/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2690  
Epoch 225/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2606  
Epoch 226/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2601  
Epoch 227/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2579  
Epoch 228/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2482  
Epoch 229/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2564  
Epoch 230/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2612  
Epoch 231/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2889  
Epoch 232/1000

13/13 [=====] - 0s 1ms/step - loss: 0.2680  
Epoch 233/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2667  
Epoch 234/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2484  
Epoch 235/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2593  
Epoch 236/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2539  
Epoch 237/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2570  
Epoch 238/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2918  
Epoch 239/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2661  
Epoch 240/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2573  
Epoch 241/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2561  
Epoch 242/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2707  
Epoch 243/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2673  
Epoch 244/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2800  
Epoch 245/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2518  
Epoch 246/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2584  
Epoch 247/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2528  
Epoch 248/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2575  
Epoch 249/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2596  
Epoch 250/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2584  
Epoch 251/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2605  
Epoch 252/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2468  
Epoch 253/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2526  
Epoch 254/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2695  
Epoch 255/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2641  
Epoch 256/1000

13/13 [=====] - 0s 1ms/step - loss: 0.2602  
Epoch 257/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2919  
Epoch 258/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2728  
Epoch 259/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2527  
Epoch 260/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2540  
Epoch 261/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2679  
Epoch 262/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2653  
Epoch 263/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2528  
Epoch 264/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2691  
Epoch 268/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2488  
Epoch 272/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2590  
Epoch 273/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2693  
Epoch 274/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2487  
Epoch 275/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2879  
Epoch 276/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2643  
Epoch 280/1000

13/13 [=====] - 0s 3ms/step - loss: 0.2568  
Epoch 281/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2578  
Epoch 282/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2498  
Epoch 283/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2571  
Epoch 284/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.2594  
Epoch 288/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2490  
Epoch 292/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2623  
Epoch 296/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2444  
Epoch 300/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2643  
Epoch 304/1000



13/13 [=====] - 0s 1ms/step - loss: 0.2736  
Epoch 305/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2964  
Epoch 306/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2600  
Epoch 307/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2774  
Epoch 308/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2600  
Epoch 309/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2554  
Epoch 310/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2507  
Epoch 311/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2488  
Epoch 312/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2486  
Epoch 313/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2906  
Epoch 314/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2616  
Epoch 315/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2615  
Epoch 316/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2564  
Epoch 317/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2498  
Epoch 318/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2488  
Epoch 319/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2740  
Epoch 320/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2479  
Epoch 321/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2435  
Epoch 322/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2432  
Epoch 323/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2625  
Epoch 324/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2695  
Epoch 325/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2709  
Epoch 326/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.2556  
Epoch 330/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 3ms/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 2ms/step - loss: 0.2638  
Epoch 342/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2478  
Epoch 346/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2412  
Epoch 350/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2671  
Epoch 354/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2434  
Epoch 358/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2699  
Epoch 359/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2456  
Epoch 360/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2712  
Epoch 361/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.2514  
Epoch 366/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2513  
Epoch 367/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2746  
Epoch 368/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2747  
Epoch 369/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2498  
Epoch 370/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2489  
Epoch 371/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2508  
Epoch 372/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2364  
Epoch 373/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2547  
Epoch 374/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2383  
Epoch 375/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2511  
Epoch 376/1000

```

13/13 [=====] - 0s 1ms/step - loss: 0.2466
Epoch 377/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2412
Epoch 378/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2559
Epoch 379/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2437
Epoch 380/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2488
Epoch 381/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2475
Epoch 382/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2464
Epoch 383/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2670
Epoch 384/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.2661
Epoch 389/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2635
Epoch 390/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2408
Epoch 391/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2482
Epoch 392/1000
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.2407
Epoch 396/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2408
Epoch 397/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2595
Epoch 398/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2593
Epoch 399/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2553
Epoch 400/1000

```

13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.2569  
Epoch 404/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.2354  
Epoch 408/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2705  
Epoch 412/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2616  
Epoch 416/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2545  
Epoch 420/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2391  
Epoch 424/1000

13/13 [=====] - 0s 3ms/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  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.2360  
Epoch 432/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2445  
Epoch 433/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2462  
Epoch 434/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2504  
Epoch 435/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2455  
Epoch 436/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2678  
Epoch 437/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2632  
Epoch 438/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2504  
Epoch 439/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2432  
Epoch 440/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2458  
Epoch 441/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2448  
Epoch 442/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2400  
Epoch 443/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2629  
Epoch 444/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2405  
Epoch 445/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2611  
Epoch 446/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2648  
Epoch 447/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2939  
Epoch 448/1000

13/13 [=====] - 0s 1ms/step - loss: 0.2452  
Epoch 449/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2321  
Epoch 450/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2363  
Epoch 451/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2472  
Epoch 452/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2394  
Epoch 453/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2387  
Epoch 454/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2373  
Epoch 455/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2383  
Epoch 456/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2410  
Epoch 457/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2328  
Epoch 458/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2508  
Epoch 459/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2407  
Epoch 460/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2385  
Epoch 461/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2616  
Epoch 462/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2420  
Epoch 463/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2382  
Epoch 464/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2448  
Epoch 465/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2504  
Epoch 466/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2577  
Epoch 467/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2492  
Epoch 468/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2464  
Epoch 469/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2335  
Epoch 470/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2444  
Epoch 471/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2558  
Epoch 472/1000

13/13 [=====] - 0s 1ms/step - loss: 0.2628  
Epoch 473/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2500  
Epoch 474/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2561  
Epoch 475/1000  
13/13 [=====] - 0s 1ms/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 3ms/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 2ms/step - loss: 0.2397  
Epoch 482/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2341  
Epoch 486/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2325  
Epoch 490/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2474  
Epoch 494/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2524  
Epoch 498/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.2426  
Epoch 502/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2469  
Epoch 503/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2586  
Epoch 504/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2434  
Epoch 505/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2349  
Epoch 506/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2417  
Epoch 507/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2423  
Epoch 508/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2325  
Epoch 509/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2506  
Epoch 510/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2414  
Epoch 511/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2281  
Epoch 512/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2615  
Epoch 513/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2466  
Epoch 514/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2527  
Epoch 515/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2626  
Epoch 516/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 2ms/step - loss: 0.2537  
Epoch 524/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2503  
Epoch 528/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 1ms/step - loss: 0.2367  
Epoch 536/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2255  
Epoch 540/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.2553  
Epoch 544/1000

13/13 [=====] - 0s 1ms/step - loss: 0.2462  
Epoch 545/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2463  
Epoch 546/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2651  
Epoch 547/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2532  
Epoch 548/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2443  
Epoch 549/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2399  
Epoch 550/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2355  
Epoch 551/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2454  
Epoch 552/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2438  
Epoch 553/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2343  
Epoch 554/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2389  
Epoch 555/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2409  
Epoch 556/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2248  
Epoch 557/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2315  
Epoch 558/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2424  
Epoch 559/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2582  
Epoch 560/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2552  
Epoch 561/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2392  
Epoch 562/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2518  
Epoch 563/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.2342  
Epoch 567/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2471  
Epoch 568/1000

13/13 [=====] - 0s 1ms/step - loss: 0.2330  
Epoch 569/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2397  
Epoch 570/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2442  
Epoch 574/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2395  
Epoch 578/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2450  
Epoch 582/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2329  
Epoch 586/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2269  
Epoch 590/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2329  
Epoch 594/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2413  
Epoch 598/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2245  
Epoch 602/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2445  
Epoch 603/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2743  
Epoch 604/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2642  
Epoch 605/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.2481  
Epoch 609/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2356  
Epoch 610/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2379  
Epoch 611/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2629  
Epoch 612/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2389  
Epoch 613/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2414  
Epoch 614/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2402  
Epoch 615/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2316  
Epoch 616/1000

13/13 [=====] - 0s 1ms/step - loss: 0.2385  
 Epoch 617/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2397  
 Epoch 618/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.2352  
 Epoch 619/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.2253  
 Epoch 620/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2218  
 Epoch 621/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2407  
 Epoch 622/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.2301  
 Epoch 623/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.2476  
 Epoch 624/1000  
 13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.2347  
 Epoch 628/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2320  
 Epoch 629/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2314  
 Epoch 630/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.2271  
 Epoch 631/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.2385  
 Epoch 632/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2352  
 Epoch 633/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2366  
 Epoch 634/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.2325  
 Epoch 635/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.2425  
 Epoch 636/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2644  
 Epoch 637/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.2497  
 Epoch 638/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.2471  
 Epoch 639/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.2270  
 Epoch 640/1000

13/13 [=====] - 0s 1ms/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 3ms/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 1ms/step - loss: 0.2367  
Epoch 648/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2255  
Epoch 649/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2348  
Epoch 650/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2537  
Epoch 651/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2377  
Epoch 652/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2329  
Epoch 653/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2212  
Epoch 654/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2405  
Epoch 655/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2316  
Epoch 656/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2244  
Epoch 657/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2280  
Epoch 658/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2265  
Epoch 659/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2217  
Epoch 660/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2351  
Epoch 661/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2234  
Epoch 662/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2297  
Epoch 663/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2287  
Epoch 664/1000

13/13 [=====] - 0s 3ms/step - loss: 0.2537  
Epoch 665/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2334  
Epoch 666/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.2447  
Epoch 670/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2217  
Epoch 671/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2320  
Epoch 672/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2542  
Epoch 673/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2308  
Epoch 674/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2357  
Epoch 675/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2376  
Epoch 676/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2288  
Epoch 677/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2243  
Epoch 678/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2216  
Epoch 679/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2363  
Epoch 680/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2322  
Epoch 681/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2361  
Epoch 682/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2318  
Epoch 683/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.2278  
Epoch 689/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2276  
Epoch 693/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2249  
Epoch 697/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2300  
Epoch 701/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2200  
Epoch 702/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2195  
Epoch 703/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2355  
Epoch 704/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2407  
Epoch 705/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2296  
Epoch 706/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2239  
Epoch 707/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2318  
Epoch 708/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2419  
Epoch 709/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2438  
Epoch 710/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2251  
Epoch 711/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2309  
Epoch 712/1000

13/13 [=====] - 0s 1ms/step - loss: 0.2541  
Epoch 713/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2406  
Epoch 714/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2223  
Epoch 715/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2201  
Epoch 716/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2311  
Epoch 717/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2446  
Epoch 718/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2268  
Epoch 719/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2434  
Epoch 720/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2284  
Epoch 721/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2355  
Epoch 722/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2216  
Epoch 723/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2356  
Epoch 724/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2228  
Epoch 725/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2337  
Epoch 726/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2289  
Epoch 727/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2364  
Epoch 728/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2410  
Epoch 729/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2280  
Epoch 730/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2242  
Epoch 731/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2416  
Epoch 732/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2303  
Epoch 733/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2363  
Epoch 734/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2381  
Epoch 735/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2343  
Epoch 736/1000

13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.2472  
Epoch 740/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2357  
Epoch 741/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2545  
Epoch 742/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2449  
Epoch 743/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2217  
Epoch 744/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2232  
Epoch 745/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2330  
Epoch 746/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2412  
Epoch 747/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2389  
Epoch 748/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2340  
Epoch 749/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2329  
Epoch 750/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2386  
Epoch 751/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2275  
Epoch 752/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2332  
Epoch 753/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2187  
Epoch 754/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2307  
Epoch 755/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2266  
Epoch 756/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 2ms/step - loss: 0.2277  
Epoch 764/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2333  
Epoch 768/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2346  
Epoch 772/1000  
13/13 [=====] - 0s 3ms/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 3ms/step - loss: 0.2427  
Epoch 777/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2226  
Epoch 778/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2274  
Epoch 779/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2393  
Epoch 780/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2316  
Epoch 781/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2360  
Epoch 782/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2194  
Epoch 783/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2290  
Epoch 784/1000

13/13 [=====] - 0s 3ms/step - loss: 0.2271  
Epoch 785/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2240  
Epoch 786/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2441  
Epoch 787/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2480  
Epoch 788/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2155  
Epoch 789/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2213  
Epoch 790/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2240  
Epoch 791/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2255  
Epoch 792/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2294  
Epoch 793/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2198  
Epoch 794/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.2281  
Epoch 798/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2324  
Epoch 799/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2183  
Epoch 800/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2152  
Epoch 801/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2228  
Epoch 802/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.2304  
Epoch 806/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2248  
Epoch 807/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2460  
Epoch 808/1000

13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.2263  
Epoch 815/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2176  
Epoch 816/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2202  
Epoch 817/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2803  
Epoch 821/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2407  
Epoch 825/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2327  
Epoch 826/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2186  
Epoch 827/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2222  
Epoch 828/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2474  
Epoch 829/1000  
13/13 [=====] - 0s 3ms/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

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13/13 [=====] - 0s 1ms/step - loss: 0.2307
Epoch 833/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2152
Epoch 837/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2193
Epoch 838/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2178
Epoch 839/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2286
Epoch 840/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2240
Epoch 841/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2171
Epoch 845/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2237
Epoch 849/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2321
Epoch 853/1000
13/13 [=====] - 0s 3ms/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

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13/13 [=====] - 0s 2ms/step - loss: 0.2205  
Epoch 857/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2217  
Epoch 861/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2264  
Epoch 862/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2207  
Epoch 863/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2172  
Epoch 864/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2645  
Epoch 865/1000  
13/13 [=====] - 0s 4ms/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 2ms/step - loss: 0.2147  
Epoch 869/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2168  
Epoch 873/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2210  
Epoch 877/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2245  
Epoch 878/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2229  
Epoch 879/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2236  
Epoch 880/1000



13/13 [=====] - 0s 1ms/step - loss: 0.2220  
Epoch 881/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2483  
Epoch 882/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2266  
Epoch 883/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2498  
Epoch 884/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2208  
Epoch 885/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2339  
Epoch 886/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2193  
Epoch 887/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2172  
Epoch 888/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2284  
Epoch 889/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2224  
Epoch 890/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2220  
Epoch 891/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2212  
Epoch 892/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2136  
Epoch 893/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2337  
Epoch 894/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2264  
Epoch 895/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2330  
Epoch 896/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2417  
Epoch 897/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2455  
Epoch 898/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2388  
Epoch 899/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2360  
Epoch 900/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2188  
Epoch 901/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2176  
Epoch 902/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2218  
Epoch 903/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.2371  
Epoch 907/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.2201  
Epoch 911/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.2241  
Epoch 915/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2216  
Epoch 916/1000  
13/13 [=====] - 0s 2ms/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 1ms/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 2ms/step - loss: 0.2331  
Epoch 923/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.2250  
Epoch 931/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2304  
Epoch 932/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 1ms/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 1ms/step - loss: 0.2121  
Epoch 951/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2133  
Epoch 952/1000

13/13 [=====] - 0s 3ms/step - loss: 0.2369  
Epoch 953/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2243  
Epoch 954/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2267  
Epoch 955/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2148  
Epoch 956/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2183  
Epoch 957/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2261  
Epoch 958/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2436  
Epoch 959/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2156  
Epoch 960/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2192  
Epoch 961/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2169  
Epoch 962/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2213  
Epoch 963/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2270  
Epoch 964/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2190  
Epoch 965/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2220  
Epoch 966/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2323  
Epoch 967/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2295  
Epoch 968/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2384  
Epoch 969/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2391  
Epoch 970/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2178  
Epoch 971/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2133  
Epoch 972/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2157  
Epoch 973/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.2259  
Epoch 978/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2185  
Epoch 979/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2188  
Epoch 980/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2210  
Epoch 981/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2144  
Epoch 985/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2157  
Epoch 989/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2375  
Epoch 990/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2285  
Epoch 991/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2383  
Epoch 992/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2293  
Epoch 993/1000  
13/13 [=====] - 0s 2ms/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 3ms/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 2ms/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 2ms/step - loss: 0.7880
Epoch 6/1000
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.6678
Epoch 10/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.6009
Epoch 14/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.5749
Epoch 18/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5784
Epoch 19/1000
13/13 [=====] - 0s 3ms/step - loss: 0.5563
Epoch 20/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5225
Epoch 21/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5378
Epoch 22/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5401
Epoch 23/1000
13/13 [=====] - 0s 3ms/step - loss: 0.5363

```

Epoch 24/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5324  
Epoch 25/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5579  
Epoch 26/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.6280  
Epoch 27/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5199  
Epoch 28/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4948  
Epoch 29/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4888  
Epoch 30/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5123  
Epoch 31/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5159  
Epoch 32/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5261  
Epoch 33/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5131  
Epoch 34/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5373  
Epoch 35/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5253  
Epoch 36/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5117  
Epoch 37/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4785  
Epoch 38/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4753  
Epoch 39/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4653  
Epoch 40/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4723  
Epoch 41/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4891  
Epoch 42/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4702  
Epoch 43/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4732  
Epoch 44/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4354

Epoch 48/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4829  
Epoch 49/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4672  
Epoch 50/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4401  
Epoch 51/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4549  
Epoch 52/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4391  
Epoch 53/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4545  
Epoch 54/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4341  
Epoch 55/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4627  
Epoch 56/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4228  
Epoch 57/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4406  
Epoch 58/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4350  
Epoch 59/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4590  
Epoch 60/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.4280  
Epoch 64/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.4278  
Epoch 68/1000  
13/13 [=====] - 0s 3ms/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



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Epoch 72/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4073
Epoch 73/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4198
Epoch 74/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4399
Epoch 75/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4173
Epoch 76/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4132
Epoch 77/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4055
Epoch 78/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4231
Epoch 79/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4440
Epoch 80/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4192
Epoch 81/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4298
Epoch 82/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4079
Epoch 83/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3980
Epoch 84/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3879
Epoch 85/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4066
Epoch 86/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4000
Epoch 87/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4279
Epoch 88/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4109
Epoch 89/1000
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3978
Epoch 93/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3892
Epoch 94/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3779
Epoch 95/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3963

```

Epoch 96/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3768  
Epoch 97/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3881  
Epoch 98/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3877  
Epoch 99/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4175  
Epoch 100/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4077  
Epoch 101/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4039  
Epoch 102/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3933  
Epoch 103/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4009  
Epoch 104/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3857  
Epoch 105/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4077  
Epoch 106/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3677  
Epoch 107/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4007  
Epoch 108/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4203  
Epoch 109/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3973  
Epoch 110/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3845  
Epoch 111/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3824  
Epoch 112/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3662  
Epoch 116/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3938

Epoch 120/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3951  
Epoch 124/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3837  
Epoch 128/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3858  
Epoch 132/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3786  
Epoch 136/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.3924  
Epoch 140/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.3714

Epoch 144/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3759  
Epoch 145/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3635  
Epoch 146/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3615  
Epoch 147/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3911  
Epoch 148/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3709  
Epoch 149/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3614  
Epoch 150/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3586  
Epoch 151/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3585  
Epoch 152/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3561  
Epoch 153/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3813  
Epoch 154/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3619  
Epoch 155/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3649  
Epoch 156/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3631  
Epoch 157/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3582  
Epoch 158/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3640  
Epoch 159/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3485  
Epoch 160/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3717  
Epoch 161/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3803  
Epoch 162/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3586  
Epoch 163/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3544  
Epoch 164/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3660  
Epoch 165/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3993  
Epoch 166/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4098  
Epoch 167/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4308

Epoch 168/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3903  
Epoch 169/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3753  
Epoch 170/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3902  
Epoch 171/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3694  
Epoch 172/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3572  
Epoch 173/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3820  
Epoch 174/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3957  
Epoch 175/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3766  
Epoch 176/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3955  
Epoch 177/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3758  
Epoch 178/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3532  
Epoch 179/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3594  
Epoch 180/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3514  
Epoch 181/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3787  
Epoch 182/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3697  
Epoch 183/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3533  
Epoch 184/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3442  
Epoch 185/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3461  
Epoch 186/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3525  
Epoch 187/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3613  
Epoch 188/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3605  
Epoch 189/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3438  
Epoch 190/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3446  
Epoch 191/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3566

```

Epoch 192/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3631
Epoch 193/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3648
Epoch 194/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3652
Epoch 195/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3450
Epoch 196/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3442
Epoch 197/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3720
Epoch 198/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3434
Epoch 199/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3497
Epoch 200/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3566
Epoch 201/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3765
Epoch 202/1000
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4030
Epoch 206/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3728
Epoch 207/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3580
Epoch 208/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3600
Epoch 209/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3791
Epoch 210/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3554
Epoch 211/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3624
Epoch 212/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3596
Epoch 213/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3528
Epoch 214/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3519
Epoch 215/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3416

```

Epoch 216/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3580  
Epoch 217/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3424  
Epoch 218/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3612  
Epoch 219/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3465  
Epoch 220/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3457  
Epoch 221/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3360  
Epoch 222/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3572  
Epoch 223/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3500  
Epoch 224/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3893  
Epoch 225/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3804  
Epoch 226/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3567  
Epoch 227/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3602  
Epoch 228/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/step - loss: 0.3414  
Epoch 237/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3392  
Epoch 238/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3709  
Epoch 239/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3593

```

Epoch 240/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3367
Epoch 241/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3393
Epoch 242/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3365
Epoch 243/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3369
Epoch 244/1000
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.3543
Epoch 253/1000
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/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 2ms/step - loss: 0.3352  
Epoch 265/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3447  
Epoch 266/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3742  
Epoch 267/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3910  
Epoch 268/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3617  
Epoch 269/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3346  
Epoch 273/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 1ms/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 1ms/step - loss: 0.3451  
Epoch 285/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.3440  
Epoch 289/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 2ms/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 2ms/step - loss: 0.3817  
Epoch 301/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3286  
Epoch 305/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3401  
Epoch 309/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3202  
Epoch 313/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3503  
Epoch 317/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3239  
Epoch 321/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3462  
Epoch 325/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3512  
Epoch 326/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3279  
Epoch 327/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3197  
Epoch 328/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3371  
Epoch 329/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3222  
Epoch 333/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3369  
Epoch 337/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3333  
Epoch 341/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3224  
Epoch 345/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3467  
Epoch 349/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3420  
Epoch 353/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3154  
Epoch 357/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3294  
Epoch 361/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3331  
Epoch 365/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3313  
Epoch 366/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3188  
Epoch 367/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3308  
Epoch 368/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3506  
Epoch 369/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3503  
Epoch 370/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3282  
Epoch 371/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3192  
Epoch 372/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3179  
Epoch 373/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3344  
Epoch 374/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3136  
Epoch 375/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.3254  
Epoch 380/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3262  
Epoch 381/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3400  
Epoch 382/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3170  
Epoch 383/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3292

Epoch 384/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3187  
Epoch 385/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3203  
Epoch 386/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3096  
Epoch 387/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3317  
Epoch 388/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3404  
Epoch 389/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3233  
Epoch 390/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3101  
Epoch 391/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3277  
Epoch 392/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3357  
Epoch 393/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3094  
Epoch 394/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3168  
Epoch 395/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3326  
Epoch 396/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.3146  
Epoch 400/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.3129  
Epoch 404/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.3132

Epoch 408/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3428  
Epoch 412/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3275  
Epoch 413/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3068  
Epoch 414/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3188  
Epoch 415/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3195  
Epoch 416/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3431  
Epoch 417/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3344  
Epoch 418/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3110  
Epoch 419/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3205  
Epoch 420/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3203  
Epoch 424/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3189  
Epoch 425/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3263  
Epoch 426/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3154  
Epoch 427/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3148  
Epoch 428/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3062

Epoch 432/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3096  
Epoch 433/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3419  
Epoch 434/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3591  
Epoch 435/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3488  
Epoch 436/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3055  
Epoch 440/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3063  
Epoch 441/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3159  
Epoch 442/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3270  
Epoch 443/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3191  
Epoch 444/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3133  
Epoch 445/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3239  
Epoch 446/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3118  
Epoch 447/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3383  
Epoch 448/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3302  
Epoch 449/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3083  
Epoch 450/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3117  
Epoch 451/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3085  
Epoch 452/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3289  
Epoch 453/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3238  
Epoch 454/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3106  
Epoch 455/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3087



Epoch 456/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3072  
Epoch 457/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3020  
Epoch 458/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3299  
Epoch 459/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3170  
Epoch 460/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3237  
Epoch 461/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3257  
Epoch 462/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3189  
Epoch 463/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3158  
Epoch 464/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3154  
Epoch 465/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3216  
Epoch 466/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3479  
Epoch 467/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3514  
Epoch 468/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3584  
Epoch 469/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3095  
Epoch 470/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3101  
Epoch 471/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3171  
Epoch 472/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3234  
Epoch 473/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3147  
Epoch 474/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3233  
Epoch 475/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3166  
Epoch 476/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3134  
Epoch 477/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3405  
Epoch 478/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3157  
Epoch 479/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3059

Epoch 480/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.3169  
Epoch 485/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 1ms/step - loss: 0.3144  
Epoch 493/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3265  
Epoch 497/1000  
13/13 [=====] - 0s 3ms/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 1ms/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 3ms/step - loss: 0.3048  
Epoch 506/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3183  
Epoch 507/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3079  
Epoch 508/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2933  
Epoch 509/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3031  
Epoch 510/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3006  
Epoch 511/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3047  
Epoch 512/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3022  
Epoch 516/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3195  
Epoch 520/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3209  
Epoch 524/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3062

Epoch 528/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3230  
Epoch 532/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3200  
Epoch 536/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2946  
Epoch 540/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3151  
Epoch 541/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3265  
Epoch 542/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3297  
Epoch 543/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3176  
Epoch 544/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.3347  
Epoch 548/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3134  
Epoch 549/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2954  
Epoch 550/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3015  
Epoch 551/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2957

Epoch 552/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.3453  
Epoch 556/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3336  
Epoch 557/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3204  
Epoch 558/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3091  
Epoch 559/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3226  
Epoch 560/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3070  
Epoch 561/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2953  
Epoch 562/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3058  
Epoch 563/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3203  
Epoch 564/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3274  
Epoch 565/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3077  
Epoch 566/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3020  
Epoch 567/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3044  
Epoch 568/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2970  
Epoch 569/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3055  
Epoch 570/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2993  
Epoch 571/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3173  
Epoch 572/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2986  
Epoch 573/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2993  
Epoch 574/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3036  
Epoch 575/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2922

Epoch 576/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2914  
Epoch 577/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3151  
Epoch 578/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3550  
Epoch 579/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2946  
Epoch 580/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3024  
Epoch 581/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3277  
Epoch 582/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3074  
Epoch 583/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3123  
Epoch 584/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3039  
Epoch 585/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3194  
Epoch 586/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3047  
Epoch 587/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3001  
Epoch 588/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2973  
Epoch 589/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2899  
Epoch 590/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2931  
Epoch 591/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3086  
Epoch 592/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3075  
Epoch 593/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2965  
Epoch 594/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2962  
Epoch 595/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4034  
Epoch 596/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3768  
Epoch 597/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3273  
Epoch 598/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3137  
Epoch 599/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3107

Epoch 600/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3082  
Epoch 601/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2931  
Epoch 602/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2938  
Epoch 603/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3229  
Epoch 604/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3136  
Epoch 605/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3287  
Epoch 606/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3176  
Epoch 607/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2975  
Epoch 608/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.3182  
Epoch 612/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.2993  
Epoch 617/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2890  
Epoch 618/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3229  
Epoch 619/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3134  
Epoch 620/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3101  
Epoch 621/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3149  
Epoch 622/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3099  
Epoch 623/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2953

Epoch 624/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2911  
Epoch 625/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2859  
Epoch 626/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3012  
Epoch 627/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3119  
Epoch 628/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3220  
Epoch 629/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3136  
Epoch 630/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/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 2ms/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 2ms/step - loss: 0.3222  
Epoch 647/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3047  
Epoch 651/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3146  
Epoch 655/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.3077  
Epoch 659/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.3192  
Epoch 663/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3300  
Epoch 664/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3133  
Epoch 665/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3039  
Epoch 666/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2982  
Epoch 667/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2915  
Epoch 668/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2929  
Epoch 669/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3197  
Epoch 670/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3089  
Epoch 671/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3112  
Epoch 675/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3089  
Epoch 676/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2862  
Epoch 677/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2934  
Epoch 678/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2899  
Epoch 679/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3003  
Epoch 680/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3051  
Epoch 681/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3134  
Epoch 682/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2988  
Epoch 683/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2940  
Epoch 684/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3022  
Epoch 685/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2996  
Epoch 686/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2956  
Epoch 687/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3108  
Epoch 688/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3063  
Epoch 689/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.2978  
Epoch 694/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3045  
Epoch 695/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2957

Epoch 696/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2959  
Epoch 697/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2968  
Epoch 698/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3083  
Epoch 699/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2970  
Epoch 700/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3045  
Epoch 701/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2951  
Epoch 702/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2998  
Epoch 703/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2944  
Epoch 704/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3042  
Epoch 705/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2955  
Epoch 706/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2958  
Epoch 707/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2976  
Epoch 708/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3087  
Epoch 709/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3085  
Epoch 710/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3190  
Epoch 711/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2935  
Epoch 712/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3174  
Epoch 713/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3109  
Epoch 714/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2899  
Epoch 715/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2830  
Epoch 716/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2960  
Epoch 717/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3067  
Epoch 718/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3218  
Epoch 719/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3385

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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 1ms/step - loss: 0.2957
Epoch 723/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3044
Epoch 724/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2923
Epoch 725/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3045
Epoch 726/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.3003
Epoch 731/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3019
Epoch 732/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2880
Epoch 733/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3022
Epoch 734/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3208
Epoch 735/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3123
Epoch 736/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3176
Epoch 737/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3273
Epoch 738/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3049
Epoch 739/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3050
Epoch 740/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3130
Epoch 741/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3245
Epoch 742/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3511
Epoch 743/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2981

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Epoch 744/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2957  
Epoch 745/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2981  
Epoch 746/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2936  
Epoch 747/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2864  
Epoch 748/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3008  
Epoch 749/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3599  
Epoch 750/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3435  
Epoch 751/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3091  
Epoch 752/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3558  
Epoch 753/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3366  
Epoch 754/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2889  
Epoch 755/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3006  
Epoch 756/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3145  
Epoch 757/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3105  
Epoch 758/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3002  
Epoch 759/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2846  
Epoch 760/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3078  
Epoch 761/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3121  
Epoch 762/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2981  
Epoch 763/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2834  
Epoch 764/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3100  
Epoch 765/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2970  
Epoch 766/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3009  
Epoch 767/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2938

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Epoch 768/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3139
Epoch 769/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2899
Epoch 770/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2825
Epoch 771/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2937
Epoch 772/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2948
Epoch 773/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3288
Epoch 774/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3042
Epoch 775/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3027
Epoch 776/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3461
Epoch 777/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3248
Epoch 778/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2962
Epoch 779/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3004
Epoch 780/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3098
Epoch 781/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2900
Epoch 782/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2843
Epoch 783/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2883
Epoch 784/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2918
Epoch 785/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2853
Epoch 786/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2971
Epoch 787/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2940
Epoch 788/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3046
Epoch 789/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3025
Epoch 790/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2957
Epoch 791/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3428

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Epoch 792/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3225
Epoch 793/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3232
Epoch 794/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3264
Epoch 795/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2912
Epoch 796/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3264
Epoch 797/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2908
Epoch 798/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.2797
Epoch 802/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2839
Epoch 803/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2877
Epoch 804/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2821
Epoch 805/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2999
Epoch 806/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3031
Epoch 807/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2934
Epoch 808/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3543
Epoch 809/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3538
Epoch 810/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3074
Epoch 811/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3039
Epoch 812/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2831
Epoch 813/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2890
Epoch 814/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2991
Epoch 815/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2894

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Epoch 816/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2962
Epoch 817/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3112
Epoch 818/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3029
Epoch 819/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3103
Epoch 820/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3399
Epoch 821/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3342
Epoch 822/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3019
Epoch 823/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2950
Epoch 824/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2926
Epoch 825/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3002
Epoch 826/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2912
Epoch 827/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2837
Epoch 828/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3008
Epoch 829/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3228
Epoch 830/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3516
Epoch 831/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3185
Epoch 832/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3020
Epoch 833/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2999
Epoch 834/1000
13/13 [=====] - 0s 2ms/step - loss: 0.2981
Epoch 835/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2876
Epoch 836/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2885
Epoch 837/1000
13/13 [=====] - 0s 1ms/step - loss: 0.2931
Epoch 838/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3015
Epoch 839/1000
13/13 [=====] - 0s 3ms/step - loss: 0.2924

```



Epoch 840/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3144  
Epoch 841/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2857  
Epoch 842/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3091  
Epoch 843/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2989  
Epoch 844/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2895  
Epoch 845/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2857  
Epoch 846/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2840  
Epoch 847/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3037  
Epoch 848/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3005  
Epoch 849/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.3102  
Epoch 853/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3152  
Epoch 854/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2965  
Epoch 855/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2880  
Epoch 856/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2866  
Epoch 857/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 1ms/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 1ms/step - loss: 0.3152  
Epoch 870/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3251  
Epoch 871/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2918  
Epoch 872/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2823  
Epoch 873/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2778  
Epoch 874/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2865  
Epoch 875/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.2906  
Epoch 876/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2993  
Epoch 877/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3067  
Epoch 878/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3285  
Epoch 879/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3180  
Epoch 880/1000  
13/13 [=====] - 0s 1ms/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 1ms/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

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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 2ms/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 1ms/step - loss: 0.3095
Epoch 897/1000
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.2911
Epoch 904/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3020
Epoch 908/1000
13/13 [=====] - 0s 3ms/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 3ms/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 2ms/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 2ms/step - loss: 0.3222  
Epoch 920/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2898  
Epoch 924/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3058  
Epoch 925/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2919  
Epoch 926/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2899  
Epoch 927/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3058  
Epoch 928/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3025  
Epoch 932/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2986

Epoch 936/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2871  
Epoch 940/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2966  
Epoch 944/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2902  
Epoch 948/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2752  
Epoch 952/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2829  
Epoch 956/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2825

Epoch 960/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3016  
Epoch 964/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2907  
Epoch 968/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2873  
Epoch 972/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.2972  
Epoch 976/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2983  
Epoch 977/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2940  
Epoch 978/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.2763  
Epoch 979/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.2868  
Epoch 980/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.2777

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Epoch 984/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2745
Epoch 988/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.2944
Epoch 992/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3374
Epoch 996/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3320
Epoch 1000/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3030
Finished lambda = 0.05
Epoch 1/1000
13/13 [=====] - 0s 2ms/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 3ms/step - loss: 0.9907
Epoch 6/1000
13/13 [=====] - 0s 1ms/step - loss: 0.9480
Epoch 7/1000

```

```

13/13 [=====] - 0s 1ms/step - loss: 0.9363
Epoch 8/1000
13/13 [=====] - 0s 2ms/step - loss: 0.8857
Epoch 9/1000
13/13 [=====] - 0s 3ms/step - loss: 0.8156
Epoch 10/1000
13/13 [=====] - 0s 1ms/step - loss: 0.7781
Epoch 11/1000
13/13 [=====] - 0s 1ms/step - loss: 0.7658
Epoch 12/1000
13/13 [=====] - 0s 2ms/step - loss: 0.7665
Epoch 13/1000
13/13 [=====] - 0s 3ms/step - loss: 0.7486
Epoch 14/1000
13/13 [=====] - 0s 1ms/step - loss: 0.7418
Epoch 15/1000
13/13 [=====] - 0s 1ms/step - loss: 0.7066
Epoch 16/1000
13/13 [=====] - 0s 1ms/step - loss: 0.7251
Epoch 17/1000
13/13 [=====] - 0s 3ms/step - loss: 0.7118
Epoch 18/1000
13/13 [=====] - 0s 1ms/step - loss: 0.7096
Epoch 19/1000
13/13 [=====] - 0s 1ms/step - loss: 0.6862
Epoch 20/1000
13/13 [=====] - 0s 2ms/step - loss: 0.6676
Epoch 21/1000
13/13 [=====] - 0s 3ms/step - loss: 0.6589
Epoch 22/1000
13/13 [=====] - 0s 1ms/step - loss: 0.6815
Epoch 23/1000
13/13 [=====] - 0s 1ms/step - loss: 0.6695
Epoch 24/1000
13/13 [=====] - 0s 2ms/step - loss: 0.6469
Epoch 25/1000
13/13 [=====] - 0s 3ms/step - loss: 0.6573
Epoch 26/1000
13/13 [=====] - 0s 1ms/step - loss: 0.7559
Epoch 27/1000
13/13 [=====] - 0s 1ms/step - loss: 0.6332
Epoch 28/1000
13/13 [=====] - 0s 2ms/step - loss: 0.6171
Epoch 29/1000
13/13 [=====] - 0s 3ms/step - loss: 0.6046
Epoch 30/1000
13/13 [=====] - 0s 1ms/step - loss: 0.6245
Epoch 31/1000

```



13/13 [=====] - 0s 1ms/step - loss: 0.6138  
Epoch 32/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.6378  
Epoch 33/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.6188  
Epoch 34/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.6609  
Epoch 35/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.6587  
Epoch 36/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.6282  
Epoch 37/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5878  
Epoch 38/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5705  
Epoch 39/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5768  
Epoch 40/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.5815  
Epoch 44/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5930  
Epoch 45/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5921  
Epoch 46/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5793  
Epoch 47/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5428  
Epoch 48/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5718  
Epoch 49/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5572  
Epoch 50/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5398  
Epoch 51/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5474  
Epoch 52/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.5577
Epoch 56/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5117
Epoch 57/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5207
Epoch 58/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5135
Epoch 59/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5387
Epoch 60/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5452
Epoch 61/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5715
Epoch 62/1000
13/13 [=====] - 0s 3ms/step - loss: 0.5423
Epoch 63/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5137
Epoch 64/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5286
Epoch 65/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5152
Epoch 66/1000
13/13 [=====] - 0s 3ms/step - loss: 0.5087
Epoch 67/1000
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4994
Epoch 71/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4990
Epoch 72/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4936
Epoch 73/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4913
Epoch 74/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5040
Epoch 75/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4984
Epoch 76/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4991
Epoch 77/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5025
Epoch 78/1000
13/13 [=====] - 0s 3ms/step - loss: 0.5214
Epoch 79/1000

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13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4969  
Epoch 83/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4764  
Epoch 87/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5024  
Epoch 88/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4932  
Epoch 89/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4790  
Epoch 90/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4675  
Epoch 91/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4867  
Epoch 92/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4786  
Epoch 93/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4648  
Epoch 94/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4594  
Epoch 95/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4748  
Epoch 96/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4565  
Epoch 97/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4674  
Epoch 98/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4644  
Epoch 99/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4918  
Epoch 100/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4890  
Epoch 101/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4837  
Epoch 102/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4679  
Epoch 103/1000

13/13 [=====] - 0s 1ms/step - loss: 0.4682  
Epoch 104/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4611  
Epoch 105/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5015  
Epoch 106/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4530  
Epoch 107/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4619  
Epoch 108/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4723  
Epoch 109/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4631  
Epoch 110/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4550  
Epoch 111/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4570  
Epoch 112/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4484  
Epoch 113/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4437  
Epoch 114/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4412  
Epoch 115/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4397  
Epoch 116/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4498  
Epoch 117/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4729  
Epoch 118/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4633  
Epoch 119/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.4443  
Epoch 124/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.4340  
Epoch 129/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4457  
Epoch 130/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4411  
Epoch 131/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4718  
Epoch 132/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4376  
Epoch 133/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4273  
Epoch 134/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4512  
Epoch 135/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4458  
Epoch 136/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4567  
Epoch 137/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4315  
Epoch 138/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4510  
Epoch 139/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4523  
Epoch 140/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4632  
Epoch 141/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4445  
Epoch 142/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4293  
Epoch 143/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4443  
Epoch 144/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4528  
Epoch 145/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4282  
Epoch 146/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4272  
Epoch 147/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4712  
Epoch 148/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4470  
Epoch 149/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4293  
Epoch 150/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4223  
Epoch 151/1000

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13/13 [=====] - 0s 1ms/step - loss: 0.4212
Epoch 152/1000
13/13 [=====] - 0s 1ms/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 1ms/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 1ms/step - loss: 0.4304
Epoch 161/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4475
Epoch 162/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4396
Epoch 163/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4155
Epoch 164/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4343
Epoch 165/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4685
Epoch 166/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4743
Epoch 167/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4786
Epoch 168/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4517
Epoch 169/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4378
Epoch 170/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4403
Epoch 171/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4281
Epoch 172/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4228
Epoch 173/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4366
Epoch 174/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4419
Epoch 175/1000

```

13/13 [=====] - 0s 3ms/step - loss: 0.4219  
Epoch 176/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4462  
Epoch 177/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4348  
Epoch 178/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4284  
Epoch 179/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4334  
Epoch 180/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4211  
Epoch 181/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4400  
Epoch 182/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4298  
Epoch 183/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4150  
Epoch 184/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4077  
Epoch 185/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4090  
Epoch 186/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4143  
Epoch 187/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4180  
Epoch 188/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4205  
Epoch 189/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4023  
Epoch 190/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4018  
Epoch 191/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4158  
Epoch 192/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4258  
Epoch 193/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4130  
Epoch 194/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4186  
Epoch 195/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4047  
Epoch 196/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3990  
Epoch 197/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4228  
Epoch 198/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3965  
Epoch 199/1000

```

13/13 [=====] - 0s 3ms/step - loss: 0.4067
Epoch 200/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4085
Epoch 201/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4336
Epoch 202/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3972
Epoch 203/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4041
Epoch 204/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4079
Epoch 205/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4638
Epoch 206/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4349
Epoch 207/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4181
Epoch 208/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4282
Epoch 209/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4402
Epoch 210/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4173
Epoch 211/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4352
Epoch 212/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4110
Epoch 213/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4028
Epoch 214/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4062
Epoch 215/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3995
Epoch 216/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4097
Epoch 217/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.3892
Epoch 222/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4103
Epoch 223/1000

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13/13 [=====] - 0s 2ms/step - loss: 0.4064
Epoch 224/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4411
Epoch 225/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4357
Epoch 226/1000
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 1ms/step - loss: 0.4031
Epoch 230/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4150
Epoch 231/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4023
Epoch 232/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4166
Epoch 233/1000
13/13 [=====] - 0s 1ms/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 3ms/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 1ms/step - loss: 0.3973
Epoch 241/1000
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.4038
Epoch 245/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4092
Epoch 246/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4170
Epoch 247/1000

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13/13 [=====] - 0s 2ms/step - loss: 0.3849  
Epoch 248/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3901  
Epoch 249/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4092  
Epoch 253/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3862  
Epoch 257/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 1ms/step - loss: 0.4051  
Epoch 265/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4139  
Epoch 269/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3850  
Epoch 270/1000  
13/13 [=====] - 0s 2ms/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 3ms/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 3ms/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 1ms/step - loss: 0.3998  
Epoch 281/1000  
13/13 [=====] - 0s 3ms/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 1ms/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 1ms/step - loss: 0.3862  
Epoch 289/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3756  
Epoch 290/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3861  
Epoch 291/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3891  
Epoch 292/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3667  
Epoch 293/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3766  
Epoch 294/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3952  
Epoch 295/1000

13/13 [=====] - 0s 1ms/step - loss: 0.4127  
Epoch 296/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3820  
Epoch 297/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3886  
Epoch 298/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3947  
Epoch 299/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3908  
Epoch 300/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4260  
Epoch 301/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3924  
Epoch 302/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3945  
Epoch 303/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3913  
Epoch 304/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3748  
Epoch 305/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3760  
Epoch 306/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3864  
Epoch 307/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3908  
Epoch 308/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3862  
Epoch 309/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.3703  
Epoch 313/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3827  
Epoch 314/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3809  
Epoch 315/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3814  
Epoch 316/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3744  
Epoch 317/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3760  
Epoch 318/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3701  
Epoch 319/1000

```

13/13 [=====] - 0s 1ms/step - loss: 0.3733
Epoch 320/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3833
Epoch 321/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3963
Epoch 322/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3963
Epoch 323/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4095
Epoch 324/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4046
Epoch 325/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3951
Epoch 326/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3824
Epoch 327/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3739
Epoch 328/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3923
Epoch 329/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3759
Epoch 330/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3641
Epoch 331/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3680
Epoch 332/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3700
Epoch 333/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4051
Epoch 334/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3900
Epoch 335/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3944
Epoch 336/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3973
Epoch 337/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4070
Epoch 338/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3750
Epoch 339/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3673
Epoch 340/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3872
Epoch 341/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3766
Epoch 342/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3723
Epoch 343/1000

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13/13 [=====] - 0s 1ms/step - loss: 0.3673
Epoch 344/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3606
Epoch 345/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3598
Epoch 346/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3622
Epoch 347/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3856
Epoch 348/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4182
Epoch 349/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3769
Epoch 350/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4017
Epoch 351/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3680
Epoch 352/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3890
Epoch 353/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3754
Epoch 354/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3651
Epoch 355/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3694
Epoch 356/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.3899
Epoch 361/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4105
Epoch 362/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4582
Epoch 363/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4070
Epoch 364/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3699
Epoch 365/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3682
Epoch 366/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3625
Epoch 367/1000

```

13/13 [=====] - 0s 1ms/step - loss: 0.3679  
Epoch 368/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3897  
Epoch 369/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3988  
Epoch 370/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3720  
Epoch 371/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3604  
Epoch 372/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3783  
Epoch 376/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3752  
Epoch 377/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3589  
Epoch 378/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3739  
Epoch 379/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3793  
Epoch 380/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3803  
Epoch 381/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4060  
Epoch 382/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3681  
Epoch 383/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3737  
Epoch 384/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3598  
Epoch 385/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3663  
Epoch 386/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3548  
Epoch 387/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3733  
Epoch 388/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3716  
Epoch 389/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3627  
Epoch 390/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3487  
Epoch 391/1000

13/13 [=====] - 0s 1ms/step - loss: 0.3634  
Epoch 392/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3779  
Epoch 393/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3564  
Epoch 394/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3581  
Epoch 395/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3865  
Epoch 396/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3781  
Epoch 397/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3888  
Epoch 398/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3748  
Epoch 399/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3696  
Epoch 400/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3682  
Epoch 401/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.3593  
Epoch 405/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3516  
Epoch 406/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3570  
Epoch 407/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3647  
Epoch 408/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3587  
Epoch 409/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3787  
Epoch 410/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3846  
Epoch 411/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3894  
Epoch 412/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3757  
Epoch 413/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3575  
Epoch 414/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3544  
Epoch 415/1000



13/13 [=====] - 0s 1ms/step - loss: 0.3712  
Epoch 416/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3780  
Epoch 417/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3834  
Epoch 418/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3596  
Epoch 419/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3664  
Epoch 420/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.3723  
Epoch 425/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3629  
Epoch 426/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3592  
Epoch 427/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3591  
Epoch 428/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3646  
Epoch 429/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3617  
Epoch 430/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3552  
Epoch 431/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3467  
Epoch 432/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4060  
Epoch 436/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3923  
Epoch 437/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3745  
Epoch 438/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3792  
Epoch 439/1000

13/13 [=====] - 0s 3ms/step - loss: 0.3463  
Epoch 440/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3666  
Epoch 444/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.3577  
Epoch 449/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3494  
Epoch 450/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3511  
Epoch 451/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3464  
Epoch 452/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.3665  
Epoch 456/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.3629  
Epoch 460/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3605  
Epoch 461/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3618  
Epoch 462/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3469  
Epoch 463/1000

13/13 [=====] - 0s 2ms/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 2ms/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 2ms/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 2ms/step - loss: 0.3700  
Epoch 476/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3609  
Epoch 477/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3839  
Epoch 478/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3651  
Epoch 479/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3499  
Epoch 480/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3552  
Epoch 481/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3492  
Epoch 482/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3707  
Epoch 483/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/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 2ms/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 2ms/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 1ms/step - loss: 0.3531  
Epoch 502/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3560  
Epoch 503/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.3493  
Epoch 508/1000  
13/13 [=====] - 0s 1ms/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 2ms/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 2ms/step - loss: 0.3615
Epoch 520/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3602
Epoch 521/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.3461
Epoch 526/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3518
Epoch 527/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3366
Epoch 528/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3418
Epoch 529/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3717
Epoch 530/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3589
Epoch 531/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3710
Epoch 532/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3415
Epoch 533/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3336
Epoch 534/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3588
Epoch 535/1000

```

13/13 [=====] - 0s 2ms/step - loss: 0.3556  
Epoch 536/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3378  
Epoch 537/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3968  
Epoch 538/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3557  
Epoch 539/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3544  
Epoch 540/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3885  
Epoch 541/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3800  
Epoch 542/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3745  
Epoch 543/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3643  
Epoch 544/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3504  
Epoch 545/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3475  
Epoch 546/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3593  
Epoch 547/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3749  
Epoch 548/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3630  
Epoch 549/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3370  
Epoch 550/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3386  
Epoch 551/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3394  
Epoch 552/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3395  
Epoch 553/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3821  
Epoch 557/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3660  
Epoch 558/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3455  
Epoch 559/1000

13/13 [=====] - 0s 2ms/step - loss: 0.3674  
Epoch 560/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3462  
Epoch 561/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3361  
Epoch 562/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3482  
Epoch 563/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3494  
Epoch 564/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3496  
Epoch 565/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3387  
Epoch 566/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3521  
Epoch 567/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3385  
Epoch 568/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3406  
Epoch 569/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3433  
Epoch 570/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3335  
Epoch 571/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3617  
Epoch 572/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3443  
Epoch 573/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3416  
Epoch 574/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3526  
Epoch 575/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3370  
Epoch 576/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3322  
Epoch 577/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3480  
Epoch 578/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4143  
Epoch 579/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3493  
Epoch 580/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3312  
Epoch 581/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3583  
Epoch 582/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3470  
Epoch 583/1000

13/13 [=====] - 0s 2ms/step - loss: 0.3501  
Epoch 584/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3704  
Epoch 585/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3771  
Epoch 586/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3524  
Epoch 587/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3451  
Epoch 588/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3323  
Epoch 589/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3272  
Epoch 590/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3307  
Epoch 591/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3425  
Epoch 592/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3412  
Epoch 593/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3367  
Epoch 594/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3413  
Epoch 595/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4272  
Epoch 596/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4031  
Epoch 597/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3599  
Epoch 598/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3473  
Epoch 599/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3397  
Epoch 600/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3571  
Epoch 601/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3329  
Epoch 602/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3372  
Epoch 603/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3517  
Epoch 604/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3426  
Epoch 605/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3557  
Epoch 606/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3698  
Epoch 607/1000



13/13 [=====] - 0s 3ms/step - loss: 0.3592  
Epoch 608/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3457  
Epoch 609/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3401  
Epoch 610/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3579  
Epoch 611/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3480  
Epoch 612/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3584  
Epoch 613/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3431  
Epoch 614/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3386  
Epoch 615/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3462  
Epoch 616/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3406  
Epoch 617/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3234  
Epoch 618/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3666  
Epoch 619/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3905  
Epoch 620/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3792  
Epoch 621/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3499  
Epoch 622/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3506  
Epoch 623/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3339  
Epoch 624/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3266  
Epoch 625/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3235  
Epoch 626/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3377  
Epoch 627/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3526  
Epoch 628/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3644  
Epoch 629/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3665  
Epoch 630/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3643  
Epoch 631/1000

13/13 [=====] - 0s 3ms/step - loss: 0.3580  
Epoch 632/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3650  
Epoch 633/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3649  
Epoch 634/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3430  
Epoch 635/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3526  
Epoch 636/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3598  
Epoch 637/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3512  
Epoch 638/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3445  
Epoch 639/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3445  
Epoch 640/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3431  
Epoch 641/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3294  
Epoch 642/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3431  
Epoch 643/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3590  
Epoch 644/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3405  
Epoch 645/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.3509  
Epoch 650/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3407  
Epoch 651/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3346  
Epoch 652/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3255  
Epoch 653/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3427  
Epoch 654/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3487  
Epoch 655/1000

13/13 [=====] - 0s 3ms/step - loss: 0.3370  
Epoch 656/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3290  
Epoch 657/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3396  
Epoch 658/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3397  
Epoch 659/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3437  
Epoch 660/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3602  
Epoch 661/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3335  
Epoch 662/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3310  
Epoch 663/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3546  
Epoch 664/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3446  
Epoch 665/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3383  
Epoch 666/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3420  
Epoch 667/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3244  
Epoch 668/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3214  
Epoch 669/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3752  
Epoch 673/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3986  
Epoch 674/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3959  
Epoch 675/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3344  
Epoch 676/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3342  
Epoch 677/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3275  
Epoch 678/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3239  
Epoch 679/1000

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13/13 [=====] - 0s 2ms/step - loss: 0.3372
Epoch 680/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3329
Epoch 681/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3464
Epoch 682/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3324
Epoch 683/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3308
Epoch 684/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3345
Epoch 685/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3396
Epoch 686/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3393
Epoch 687/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3373
Epoch 688/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3254
Epoch 689/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3936
Epoch 690/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3678
Epoch 691/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3424
Epoch 692/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3462
Epoch 693/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3388
Epoch 694/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3413
Epoch 695/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3331
Epoch 696/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3298
Epoch 697/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3293
Epoch 698/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3415
Epoch 699/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3392
Epoch 700/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3387
Epoch 701/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3316
Epoch 702/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3209
Epoch 703/1000

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13/13 [=====] - 0s 2ms/step - loss: 0.3198  
Epoch 704/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3448  
Epoch 705/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3384  
Epoch 706/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3431  
Epoch 707/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3416  
Epoch 708/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3378  
Epoch 709/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3513  
Epoch 710/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3481  
Epoch 711/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3312  
Epoch 712/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3759  
Epoch 713/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3535  
Epoch 714/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3329  
Epoch 715/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3257  
Epoch 716/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3310  
Epoch 717/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3459  
Epoch 718/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3696  
Epoch 719/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4027  
Epoch 720/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3473  
Epoch 721/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.3511  
Epoch 725/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3742  
Epoch 726/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3558  
Epoch 727/1000

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13/13 [=====] - 0s 2ms/step - loss: 0.3311
Epoch 728/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3416
Epoch 729/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3327
Epoch 730/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3392
Epoch 731/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3409
Epoch 732/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3441
Epoch 733/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3286
Epoch 734/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3408
Epoch 735/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3281
Epoch 736/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3344
Epoch 737/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3351
Epoch 738/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3552
Epoch 739/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3518
Epoch 740/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3398
Epoch 741/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3642
Epoch 742/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3936
Epoch 743/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3476
Epoch 744/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3306
Epoch 745/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3215
Epoch 746/1000
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.3707
Epoch 750/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3405
Epoch 751/1000

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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 1ms/step - loss: 0.3922
Epoch 754/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3505
Epoch 758/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3569
Epoch 762/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3366
Epoch 766/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3349
Epoch 770/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3724
Epoch 774/1000
13/13 [=====] - 0s 3ms/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 1ms/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 1ms/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 2ms/step - loss: 0.3204  
Epoch 786/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3317  
Epoch 790/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3458  
Epoch 794/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3182  
Epoch 798/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3606  
Epoch 799/1000



13/13 [=====] - 0s 2ms/step - loss: 0.3639  
Epoch 800/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3380  
Epoch 801/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3207  
Epoch 802/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3424  
Epoch 806/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3446  
Epoch 807/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3256  
Epoch 808/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3519  
Epoch 809/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3590  
Epoch 810/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3243  
Epoch 814/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3561  
Epoch 818/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3856  
Epoch 822/1000  
13/13 [=====] - 0s 3ms/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 1ms/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 2ms/step - loss: 0.3663  
Epoch 830/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3373  
Epoch 834/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3255  
Epoch 838/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3364  
Epoch 842/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.3173  
Epoch 846/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3168  
Epoch 847/1000

13/13 [=====] - 0s 3ms/step - loss: 0.3376  
Epoch 848/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3374  
Epoch 849/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3102  
Epoch 850/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3311  
Epoch 851/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3324  
Epoch 852/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3421  
Epoch 853/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3538  
Epoch 854/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3325  
Epoch 858/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3583  
Epoch 862/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3746  
Epoch 866/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3259  
Epoch 870/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3252  
Epoch 874/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.3476  
Epoch 886/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.3324  
Epoch 894/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3442  
Epoch 895/1000

13/13 [=====] - 0s 1ms/step - loss: 0.3877  
Epoch 896/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/step - loss: 0.3553  
Epoch 904/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.3518  
Epoch 909/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3818  
Epoch 910/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3517  
Epoch 911/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3209  
Epoch 912/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3239  
Epoch 913/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3153  
Epoch 914/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3464  
Epoch 915/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3383  
Epoch 916/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3459  
Epoch 917/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3375  
Epoch 918/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3303  
Epoch 919/1000

13/13 [=====] - 0s 2ms/step - loss: 0.3524  
Epoch 920/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3599  
Epoch 921/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3388  
Epoch 922/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3469  
Epoch 923/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3260  
Epoch 924/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3414  
Epoch 925/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3271  
Epoch 926/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3185  
Epoch 927/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3421  
Epoch 928/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3281  
Epoch 929/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3429  
Epoch 930/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3786  
Epoch 931/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4084  
Epoch 932/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3646  
Epoch 933/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3359  
Epoch 934/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3700  
Epoch 935/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3342  
Epoch 936/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3338  
Epoch 937/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3377  
Epoch 938/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3529  
Epoch 939/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3584  
Epoch 940/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3416  
Epoch 941/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3160  
Epoch 942/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3160  
Epoch 943/1000

13/13 [=====] - 0s 2ms/step - loss: 0.3338  
Epoch 944/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3416  
Epoch 945/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3511  
Epoch 946/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3243  
Epoch 947/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3321  
Epoch 948/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3206  
Epoch 949/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3159  
Epoch 950/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3080  
Epoch 951/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3044  
Epoch 952/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3275  
Epoch 953/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3315  
Epoch 954/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3513  
Epoch 955/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3112  
Epoch 956/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.3210  
Epoch 961/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3148  
Epoch 965/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 2ms/step - loss: 0.3135  
Epoch 973/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3205  
Epoch 974/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3144  
Epoch 975/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3372  
Epoch 976/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.3281  
Epoch 980/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3304  
Epoch 981/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3239  
Epoch 982/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3219  
Epoch 983/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3082  
Epoch 984/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3298  
Epoch 985/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3461  
Epoch 986/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3448  
Epoch 987/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3458  
Epoch 988/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3124  
Epoch 989/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3262  
Epoch 990/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3221  
Epoch 991/1000



```

13/13 [=====] - 0s 3ms/step - loss: 0.3159
Epoch 992/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3454
Epoch 993/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3152
Epoch 994/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3329
Epoch 995/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3494
Epoch 996/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3437
Epoch 997/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3686
Epoch 998/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3193
Epoch 999/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3471
Epoch 1000/1000
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 2.0539
Epoch 3/1000
13/13 [=====] - 0s 2ms/step - loss: 1.7673
Epoch 4/1000
13/13 [=====] - 0s 2ms/step - loss: 1.4216
Epoch 5/1000
13/13 [=====] - 0s 2ms/step - loss: 1.2743
Epoch 6/1000
13/13 [=====] - 0s 2ms/step - loss: 1.2351
Epoch 7/1000
13/13 [=====] - 0s 2ms/step - loss: 1.1670
Epoch 8/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.9683
Epoch 12/1000
13/13 [=====] - 0s 3ms/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

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Epoch 15/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.9075  
Epoch 16/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.8961  
Epoch 17/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.8946  
Epoch 18/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.8974  
Epoch 19/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.8728  
Epoch 20/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.8348  
Epoch 24/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.7978  
Epoch 25/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.8064  
Epoch 26/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.9342  
Epoch 27/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.8211  
Epoch 28/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.7830  
Epoch 32/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.7801  
Epoch 36/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.7287  
Epoch 37/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.7261  
Epoch 38/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.7039

Epoch 39/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.7075  
Epoch 40/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.7192  
Epoch 44/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.7187  
Epoch 45/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.7053  
Epoch 46/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.6948  
Epoch 47/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.6840  
Epoch 48/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.6735  
Epoch 52/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.6783  
Epoch 56/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.6480  
Epoch 60/1000  
13/13 [=====] - 0s 3ms/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

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Epoch 63/1000
13/13 [=====] - 0s 1ms/step - loss: 0.6270
Epoch 64/1000
13/13 [=====] - 0s 3ms/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 1ms/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 2ms/step - loss: 0.6117
Epoch 72/1000
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.6094
Epoch 76/1000
13/13 [=====] - 0s 2ms/step - loss: 0.6126
Epoch 77/1000
13/13 [=====] - 0s 3ms/step - loss: 0.6040
Epoch 78/1000
13/13 [=====] - 0s 1ms/step - loss: 0.6133
Epoch 79/1000
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.5895
Epoch 84/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5818
Epoch 85/1000
13/13 [=====] - 0s 3ms/step - loss: 0.5913
Epoch 86/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5868

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Epoch 87/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.6109  
Epoch 88/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5921  
Epoch 89/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5855  
Epoch 90/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5764  
Epoch 91/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5730  
Epoch 92/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5754  
Epoch 93/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5625  
Epoch 94/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5611  
Epoch 95/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5659  
Epoch 96/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.5921  
Epoch 100/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.5670  
Epoch 104/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.5625  
Epoch 108/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5698  
Epoch 109/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5614  
Epoch 110/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5551

Epoch 111/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5539  
Epoch 112/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5501  
Epoch 113/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5429  
Epoch 114/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5430  
Epoch 115/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.5710  
Epoch 119/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5637  
Epoch 120/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5547  
Epoch 121/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5517  
Epoch 122/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.5392  
Epoch 127/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.5271  
Epoch 131/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5492  
Epoch 132/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5412  
Epoch 133/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5121  
Epoch 134/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5440

Epoch 135/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5316  
Epoch 136/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5315  
Epoch 137/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5231  
Epoch 138/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5441  
Epoch 139/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5339  
Epoch 140/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5477  
Epoch 141/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5526  
Epoch 142/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5221  
Epoch 143/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5245  
Epoch 144/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5446  
Epoch 145/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5251  
Epoch 146/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5246  
Epoch 147/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5687  
Epoch 148/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5433  
Epoch 149/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5319  
Epoch 150/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5268  
Epoch 151/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5142  
Epoch 152/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5240  
Epoch 153/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.5165  
Epoch 157/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5224  
Epoch 158/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5168

```

Epoch 159/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5120
Epoch 160/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5204
Epoch 161/1000
13/13 [=====] - 0s 3ms/step - loss: 0.5412
Epoch 162/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5509
Epoch 163/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5090
Epoch 164/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5220
Epoch 165/1000
13/13 [=====] - 0s 3ms/step - loss: 0.5446
Epoch 166/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5481
Epoch 167/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5393
Epoch 168/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5321
Epoch 169/1000
13/13 [=====] - 0s 3ms/step - loss: 0.5145
Epoch 170/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.5121
Epoch 175/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4920
Epoch 176/1000
13/13 [=====] - 0s 3ms/step - loss: 0.5140
Epoch 177/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5133
Epoch 178/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5101
Epoch 179/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5034
Epoch 180/1000
13/13 [=====] - 0s 3ms/step - loss: 0.5260
Epoch 181/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5079
Epoch 182/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4972

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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 2ms/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 2ms/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 2ms/step - loss: 0.4877  
 Epoch 195/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.4781  
 Epoch 196/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.4782  
 Epoch 197/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.4984  
 Epoch 198/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.4815  
 Epoch 199/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.4885  
 Epoch 200/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.4851  
 Epoch 201/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.5004  
 Epoch 202/1000  
 13/13 [=====] - 0s 2ms/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 2ms/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 2ms/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 2ms/step - loss: 0.4768  
Epoch 214/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4778  
Epoch 215/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4822  
Epoch 216/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4962  
Epoch 217/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4872  
Epoch 218/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4994  
Epoch 219/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4827  
Epoch 220/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4782  
Epoch 221/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4634  
Epoch 222/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4772  
Epoch 223/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4859  
Epoch 224/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4898  
Epoch 225/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4762  
Epoch 226/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5080  
Epoch 227/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5122  
Epoch 228/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4841  
Epoch 229/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4845  
Epoch 230/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5012

Epoch 231/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5028  
Epoch 232/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5129  
Epoch 233/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4736  
Epoch 234/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4731  
Epoch 235/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4769  
Epoch 236/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4821  
Epoch 237/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4804  
Epoch 238/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5055  
Epoch 239/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.4687  
Epoch 243/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4740  
Epoch 247/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4668  
Epoch 251/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4846

Epoch 255/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.4673  
Epoch 262/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5219  
Epoch 263/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4987  
Epoch 264/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4643  
Epoch 265/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.4502  
Epoch 270/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4541  
Epoch 271/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4623  
Epoch 272/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4632  
Epoch 273/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.4575  
Epoch 278/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4556

Epoch 279/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4813  
Epoch 280/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4732  
Epoch 281/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.4667  
Epoch 286/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4691  
Epoch 287/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4781  
Epoch 288/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4670  
Epoch 289/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4534  
Epoch 290/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4645  
Epoch 291/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4711  
Epoch 292/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4496  
Epoch 293/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4550  
Epoch 294/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4619  
Epoch 295/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4962  
Epoch 296/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4634  
Epoch 297/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.4646  
Epoch 301/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4555  
Epoch 302/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4486

Epoch 303/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4648  
Epoch 304/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4790  
Epoch 305/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4483  
Epoch 306/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4747  
Epoch 307/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4580  
Epoch 308/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4517  
Epoch 309/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4528  
Epoch 310/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4420  
Epoch 311/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4358  
Epoch 312/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4391  
Epoch 313/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4479  
Epoch 314/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4500  
Epoch 315/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4424  
Epoch 316/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4381  
Epoch 320/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4483  
Epoch 321/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4567  
Epoch 322/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4630  
Epoch 323/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4733  
Epoch 324/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5019  
Epoch 325/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4804  
Epoch 326/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4697

Epoch 327/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4579  
Epoch 328/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4670  
Epoch 329/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4432  
Epoch 330/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4404  
Epoch 331/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4418  
Epoch 332/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4393  
Epoch 333/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4917  
Epoch 334/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/step - loss: 0.4287  
Epoch 343/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4270  
Epoch 344/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4279  
Epoch 345/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4243  
Epoch 346/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4278  
Epoch 347/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4407  
Epoch 348/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4658  
Epoch 349/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4492  
Epoch 350/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4370  
Epoch 354/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.4349  
Epoch 366/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4236  
Epoch 367/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4330  
Epoch 368/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4365  
Epoch 369/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4341  
Epoch 370/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4451  
Epoch 371/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4282  
Epoch 372/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4236  
Epoch 373/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4346  
Epoch 374/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4385



Epoch 375/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4458  
Epoch 376/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4615  
Epoch 377/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4185  
Epoch 378/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4298  
Epoch 379/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4391  
Epoch 380/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 3ms/step - loss: 0.4379  
Epoch 388/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4361  
Epoch 389/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4287  
Epoch 390/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4158  
Epoch 391/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4257  
Epoch 392/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4339  
Epoch 393/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4222  
Epoch 394/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4364  
Epoch 395/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4726  
Epoch 396/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4845  
Epoch 397/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4799  
Epoch 398/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4498

Epoch 399/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 2ms/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 2ms/step - loss: 0.4187  
Epoch 410/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.4261  
Epoch 414/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4419  
Epoch 415/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4578  
Epoch 416/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4202  
Epoch 417/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4398  
Epoch 418/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4282  
Epoch 419/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4175  
Epoch 420/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4094  
Epoch 421/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4332  
Epoch 422/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4391

Epoch 423/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4282  
Epoch 424/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4122  
Epoch 425/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4146  
Epoch 426/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4176  
Epoch 427/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4376  
Epoch 428/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4367  
Epoch 429/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4254  
Epoch 430/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4266  
Epoch 431/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4066  
Epoch 432/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4151  
Epoch 433/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4197  
Epoch 434/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4438  
Epoch 435/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4443  
Epoch 436/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4279  
Epoch 437/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4354  
Epoch 438/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.4486  
Epoch 446/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4066  
Epoch 450/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4377  
Epoch 454/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4549  
Epoch 455/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4589  
Epoch 456/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4453  
Epoch 457/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4091  
Epoch 458/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/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 2ms/step - loss: 0.4647  
Epoch 470/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4229

Epoch 471/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4145  
Epoch 472/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4521  
Epoch 473/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4735  
Epoch 474/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4743  
Epoch 475/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4284  
Epoch 476/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4034  
Epoch 477/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4337  
Epoch 478/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4107  
Epoch 479/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4605  
Epoch 480/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4719  
Epoch 481/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4435  
Epoch 482/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4305  
Epoch 483/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4702  
Epoch 484/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4382  
Epoch 485/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4635  
Epoch 486/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4194  
Epoch 487/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4035  
Epoch 488/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4070  
Epoch 489/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3948  
Epoch 490/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.4822  
Epoch 498/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4050  
Epoch 502/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.4085  
Epoch 510/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4034  
Epoch 511/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4171  
Epoch 512/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4094  
Epoch 513/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4106  
Epoch 514/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4130  
Epoch 515/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.4151  
Epoch 520/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4168  
Epoch 521/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4337  
Epoch 522/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4078  
Epoch 523/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4504  
Epoch 524/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4166  
Epoch 525/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4297  
Epoch 526/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4195  
Epoch 527/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3891  
Epoch 528/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3932  
Epoch 529/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4283  
Epoch 530/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4208  
Epoch 531/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4168  
Epoch 532/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4060  
Epoch 533/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3915  
Epoch 534/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 3ms/step - loss: 0.4213

Epoch 543/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4211  
Epoch 544/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4390  
Epoch 545/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4002  
Epoch 546/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3978  
Epoch 550/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/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 1ms/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 2ms/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 2ms/step - loss: 0.4200  
Epoch 569/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4056  
Epoch 570/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4390  
Epoch 571/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4195  
Epoch 572/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4159  
Epoch 573/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4151  
Epoch 574/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4285  
Epoch 575/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4161  
Epoch 576/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4002  
Epoch 577/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4012  
Epoch 578/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4826  
Epoch 579/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4323  
Epoch 580/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3979  
Epoch 581/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4081  
Epoch 582/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4111  
Epoch 583/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4020  
Epoch 584/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4224  
Epoch 585/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4452  
Epoch 586/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4275  
Epoch 587/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4059  
Epoch 588/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3806  
Epoch 589/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.4217  
Epoch 597/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 2ms/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 2ms/step - loss: 0.4204  
Epoch 609/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4018  
Epoch 610/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4288  
Epoch 611/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4345  
Epoch 612/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4396  
Epoch 613/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4220  
Epoch 614/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4076

Epoch 615/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4151  
Epoch 616/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4375  
Epoch 617/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4107  
Epoch 618/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4320  
Epoch 619/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5052  
Epoch 620/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4725  
Epoch 621/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3986  
Epoch 622/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3926  
Epoch 623/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3904  
Epoch 624/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3843  
Epoch 625/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4224  
Epoch 629/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4081  
Epoch 630/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4002  
Epoch 631/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3999  
Epoch 632/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.4069  
Epoch 636/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4228  
Epoch 637/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4017  
Epoch 638/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3951

Epoch 639/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.3887  
 Epoch 640/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.4111  
 Epoch 641/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.3916  
 Epoch 642/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.4167  
 Epoch 643/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.4325  
 Epoch 644/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.3954  
 Epoch 645/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.4429  
 Epoch 646/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.4494  
 Epoch 647/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.3927  
 Epoch 648/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.3984  
 Epoch 649/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.3853  
 Epoch 650/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.3866  
 Epoch 651/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.3837  
 Epoch 652/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.3766  
 Epoch 653/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.3934  
 Epoch 654/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.4094  
 Epoch 655/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.4130  
 Epoch 656/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.4033  
 Epoch 657/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.3898  
 Epoch 658/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.3824  
 Epoch 659/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.3789  
 Epoch 660/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.4124  
 Epoch 661/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.3841  
 Epoch 662/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.3863

```

Epoch 663/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4046
Epoch 664/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4014
Epoch 665/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3959
Epoch 666/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4139
Epoch 667/1000
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.3916
Epoch 671/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3856
Epoch 672/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3960
Epoch 673/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3896
Epoch 674/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4161
Epoch 675/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3998
Epoch 676/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3994
Epoch 677/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3928
Epoch 678/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3879
Epoch 679/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3903
Epoch 680/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3870
Epoch 681/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4057
Epoch 682/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3845
Epoch 683/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3840
Epoch 684/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3963
Epoch 685/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3952
Epoch 686/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3890

```

Epoch 687/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3848  
Epoch 688/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3721  
Epoch 689/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4237  
Epoch 690/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4118  
Epoch 691/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4134  
Epoch 692/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3938  
Epoch 693/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3770  
Epoch 694/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3862  
Epoch 695/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4123  
Epoch 699/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3843  
Epoch 703/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3935  
Epoch 707/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4077  
Epoch 708/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4006  
Epoch 709/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4320  
Epoch 710/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4190

Epoch 711/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4116  
Epoch 712/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4650  
Epoch 713/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4132  
Epoch 714/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4076  
Epoch 715/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3789  
Epoch 716/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3663  
Epoch 717/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3898  
Epoch 718/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3906  
Epoch 719/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4335  
Epoch 720/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4034  
Epoch 721/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3927  
Epoch 722/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3845  
Epoch 723/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4026  
Epoch 724/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3912  
Epoch 725/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4131  
Epoch 726/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4280  
Epoch 727/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4130  
Epoch 728/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4061  
Epoch 729/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3721  
Epoch 730/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3998  
Epoch 731/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3981  
Epoch 732/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3849  
Epoch 733/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3849  
Epoch 734/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.4134  
Epoch 739/1000  
13/13 [=====] - 0s 2ms/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 1ms/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 2ms/step - loss: 0.3870  
Epoch 748/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4073  
Epoch 752/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4913  
Epoch 753/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4641  
Epoch 754/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3999  
Epoch 755/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3859  
Epoch 756/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4016  
Epoch 757/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4226  
Epoch 758/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4450



Epoch 759/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4368  
Epoch 760/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4685  
Epoch 761/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4577  
Epoch 762/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4308  
Epoch 763/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4102  
Epoch 764/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4147  
Epoch 765/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3958  
Epoch 766/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3872  
Epoch 767/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3981  
Epoch 768/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3820  
Epoch 769/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3839  
Epoch 773/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3958  
Epoch 777/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.3780  
Epoch 781/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4091  
Epoch 782/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4240

Epoch 783/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3895  
Epoch 784/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3774  
Epoch 785/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3770  
Epoch 786/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3863  
Epoch 787/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3959  
Epoch 788/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3721  
Epoch 789/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4304  
Epoch 793/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4052  
Epoch 794/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4161  
Epoch 795/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3819  
Epoch 796/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4294  
Epoch 797/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3900  
Epoch 798/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4082  
Epoch 799/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3857  
Epoch 800/1000  
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/step - loss: 0.3825  
Epoch 808/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3951  
Epoch 809/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4260  
Epoch 810/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3754  
Epoch 811/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3664  
Epoch 812/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3676  
Epoch 813/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3713  
Epoch 814/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3711  
Epoch 815/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3957  
Epoch 816/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3966  
Epoch 817/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3852  
Epoch 818/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3811  
Epoch 819/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3834  
Epoch 820/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4293  
Epoch 821/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4380  
Epoch 822/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4316  
Epoch 823/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3825  
Epoch 824/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3768  
Epoch 825/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3765  
Epoch 826/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3758  
Epoch 827/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3657  
Epoch 828/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3794  
Epoch 829/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3976  
Epoch 830/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4414

Epoch 831/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4030  
Epoch 832/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.3742  
Epoch 836/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3773  
Epoch 840/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.3867  
Epoch 848/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.3921  
Epoch 852/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3911  
Epoch 853/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3954  
Epoch 854/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3818

Epoch 855/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3723  
Epoch 856/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3775  
Epoch 857/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3798  
Epoch 858/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3882  
Epoch 859/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4555  
Epoch 860/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3883  
Epoch 861/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4177  
Epoch 862/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3927  
Epoch 863/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3764  
Epoch 864/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4406  
Epoch 865/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4551  
Epoch 866/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4149  
Epoch 867/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3941  
Epoch 868/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3828  
Epoch 869/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3786  
Epoch 870/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3908  
Epoch 871/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4018  
Epoch 872/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3756  
Epoch 873/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3608  
Epoch 874/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3666  
Epoch 875/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3735  
Epoch 876/1000  
13/13 [=====] - 0s 2ms/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 3ms/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 2ms/step - loss: 0.4647
Epoch 884/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.3847
Epoch 888/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3827
Epoch 889/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.3799
Epoch 893/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3984
Epoch 894/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3896
Epoch 895/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4349
Epoch 896/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4009
Epoch 897/1000
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/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 2ms/step - loss: 0.3975  
Epoch 909/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4462  
Epoch 910/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 2ms/step - loss: 0.4254  
Epoch 921/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.3982  
Epoch 925/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3714  
Epoch 926/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3732

Epoch 927/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4063  
Epoch 931/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4157  
Epoch 932/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4325  
Epoch 933/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4214  
Epoch 934/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4030  
Epoch 935/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3826  
Epoch 936/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3694  
Epoch 937/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3678  
Epoch 938/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3851  
Epoch 939/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3942  
Epoch 940/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3825  
Epoch 941/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3634  
Epoch 942/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3627  
Epoch 943/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3759  
Epoch 944/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3871  
Epoch 945/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3658  
Epoch 946/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3667  
Epoch 947/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3887  
Epoch 948/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3801  
Epoch 949/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3629  
Epoch 950/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3577



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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 1ms/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 1ms/step - loss: 0.4042
Epoch 958/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3691
Epoch 959/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3640
Epoch 960/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3759
Epoch 961/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3745
Epoch 962/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3580
Epoch 963/1000
13/13 [=====] - 0s 3ms/step - loss: 0.3831
Epoch 964/1000
13/13 [=====] - 0s 1ms/step - loss: 0.3613
Epoch 965/1000
13/13 [=====] - 0s 2ms/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 2ms/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 1ms/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 2ms/step - loss: 0.3679  
Epoch 983/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3571  
Epoch 984/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3819  
Epoch 985/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3704  
Epoch 986/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3774  
Epoch 987/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3835  
Epoch 988/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3590  
Epoch 989/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3715  
Epoch 990/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3605  
Epoch 991/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3784  
Epoch 992/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3695  
Epoch 993/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3768  
Epoch 994/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.3748  
Epoch 995/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.3912  
Epoch 996/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.3966  
Epoch 997/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4233  
Epoch 998/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 2.0224
Epoch 4/1000
13/13 [=====] - 0s 1ms/step - loss: 1.6617
Epoch 5/1000
13/13 [=====] - 0s 2ms/step - loss: 1.5529
Epoch 6/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 1.3823
Epoch 10/1000
13/13 [=====] - 0s 3ms/step - loss: 1.3487
Epoch 11/1000
13/13 [=====] - 0s 1ms/step - loss: 1.2859
Epoch 12/1000
13/13 [=====] - 0s 2ms/step - loss: 1.2361
Epoch 13/1000
13/13 [=====] - 0s 2ms/step - loss: 1.2227
Epoch 14/1000
13/13 [=====] - 0s 2ms/step - loss: 1.1711
Epoch 15/1000
13/13 [=====] - 0s 1ms/step - loss: 1.1076
Epoch 16/1000
13/13 [=====] - 0s 2ms/step - loss: 1.0964
Epoch 17/1000
13/13 [=====] - 0s 3ms/step - loss: 1.1096
Epoch 18/1000
13/13 [=====] - 0s 1ms/step - loss: 1.0697
Epoch 19/1000
13/13 [=====] - 0s 1ms/step - loss: 1.0372
Epoch 20/1000
13/13 [=====] - 0s 2ms/step - loss: 1.0143
Epoch 21/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.9319
Epoch 29/1000
13/13 [=====] - 0s 1ms/step - loss: 0.8973
Epoch 30/1000
13/13 [=====] - 0s 3ms/step - loss: 0.9171
Epoch 31/1000
13/13 [=====] - 0s 1ms/step - loss: 0.9031
Epoch 32/1000
13/13 [=====] - 0s 1ms/step - loss: 0.9235
Epoch 33/1000
13/13 [=====] - 0s 2ms/step - loss: 0.8815
Epoch 34/1000
13/13 [=====] - 0s 3ms/step - loss: 0.8816
Epoch 35/1000
13/13 [=====] - 0s 1ms/step - loss: 0.8773
Epoch 36/1000
13/13 [=====] - 0s 2ms/step - loss: 0.8623
Epoch 37/1000
13/13 [=====] - 0s 2ms/step - loss: 0.8511
Epoch 38/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.8582
Epoch 42/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.8335
Epoch 46/1000

```

13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.8180  
Epoch 50/1000  
13/13 [=====] - 0s 1ms/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 3ms/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 2ms/step - loss: 0.7531  
Epoch 59/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.7732  
Epoch 60/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.7617  
Epoch 61/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.8013  
Epoch 62/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.7902  
Epoch 63/1000  
13/13 [=====] - 0s 1ms/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 3ms/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 2ms/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 2ms/step - loss: 0.7393  
Epoch 75/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.7151  
Epoch 76/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 2ms/step - loss: 0.7064  
Epoch 83/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.6878  
Epoch 84/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.6923  
Epoch 85/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.6891  
Epoch 86/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.6944  
Epoch 87/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.6866  
Epoch 88/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.6602  
Epoch 98/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.6746  
Epoch 99/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.6932  
Epoch 100/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.7013  
Epoch 101/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.6920  
Epoch 102/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.6594  
Epoch 103/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.6660  
Epoch 104/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.6576  
Epoch 105/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.7019  
Epoch 106/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.7179  
Epoch 107/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.6857  
Epoch 108/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.6916  
Epoch 109/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.6818  
Epoch 110/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.6770  
Epoch 111/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.6666  
Epoch 112/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.6476  
Epoch 113/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.6423  
Epoch 114/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.6374  
Epoch 115/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.6376  
Epoch 116/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.6437  
Epoch 117/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.6676  
Epoch 118/1000

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



13/13 [=====] - 0s 1ms/step - loss: 0.6105  
Epoch 143/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.6082  
Epoch 144/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.6236  
Epoch 145/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.6250  
Epoch 149/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.6050  
Epoch 153/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/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 2ms/step - loss: 0.5938  
Epoch 165/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.6148  
Epoch 166/1000

13/13 [=====] - 0s 1ms/step - loss: 0.6169  
Epoch 167/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.6042  
Epoch 168/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.6015  
Epoch 169/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5850  
Epoch 170/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5979  
Epoch 171/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5919  
Epoch 172/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5865  
Epoch 173/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5903  
Epoch 174/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5936  
Epoch 175/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5742  
Epoch 176/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5849  
Epoch 177/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5925  
Epoch 178/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5820  
Epoch 179/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.5776  
Epoch 183/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5683  
Epoch 184/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5760  
Epoch 185/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5767  
Epoch 186/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5964  
Epoch 187/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5766  
Epoch 188/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5787  
Epoch 189/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5706  
Epoch 190/1000

13/13 [=====] - 0s 3ms/step - loss: 0.5642  
Epoch 191/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5839  
Epoch 192/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5801  
Epoch 193/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5664  
Epoch 194/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.5705  
Epoch 198/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.5811  
Epoch 202/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.6330  
Epoch 206/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5756  
Epoch 207/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 2ms/step - loss: 0.5513  
Epoch 215/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.5613  
Epoch 219/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5630  
Epoch 220/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5490  
Epoch 221/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5398  
Epoch 222/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5513  
Epoch 223/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 2ms/step - loss: 0.6289  
Epoch 231/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 3ms/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 2ms/step - loss: 0.5363  
Epoch 243/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5389  
Epoch 244/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.5265  
Epoch 248/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.5605  
Epoch 253/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5376  
Epoch 254/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5612  
Epoch 255/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5493  
Epoch 256/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5328  
Epoch 257/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5379  
Epoch 258/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5341  
Epoch 259/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5378  
Epoch 260/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5596  
Epoch 261/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5316  
Epoch 262/1000

13/13 [=====] - 0s 1ms/step - loss: 0.5894  
Epoch 263/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5886  
Epoch 264/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5514  
Epoch 265/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5341  
Epoch 266/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5542  
Epoch 267/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5488  
Epoch 268/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5537  
Epoch 269/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5158  
Epoch 270/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.5438  
Epoch 274/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5211  
Epoch 275/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5224  
Epoch 276/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5301  
Epoch 277/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5300  
Epoch 278/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5242  
Epoch 279/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5581  
Epoch 280/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5602  
Epoch 281/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5229  
Epoch 282/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5211  
Epoch 283/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5244  
Epoch 284/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5133  
Epoch 285/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5264  
Epoch 286/1000

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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 2ms/step - loss: 0.5609
Epoch 289/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.5152
Epoch 293/1000
13/13 [=====] - 0s 2ms/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 1ms/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 2ms/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 2ms/step - loss: 0.5167
Epoch 310/1000

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13/13 [=====] - 0s 3ms/step - loss: 0.5128
Epoch 311/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4996
Epoch 312/1000
13/13 [=====] - 0s 2ms/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 1ms/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 3ms/step - loss: 0.5014
Epoch 319/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5003
Epoch 320/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5168
Epoch 321/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5150
Epoch 322/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.5624
Epoch 326/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5438
Epoch 327/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5508
Epoch 328/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5268
Epoch 329/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5066
Epoch 330/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.5705
Epoch 334/1000

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13/13 [=====] - 0s 3ms/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
13/13 [=====] - 0s 2ms/step - loss: 0.5316
Epoch 338/1000
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.4977
Epoch 342/1000
13/13 [=====] - 0s 3ms/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 1ms/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 2ms/step - loss: 0.5078
Epoch 351/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4918
Epoch 355/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4945
Epoch 356/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4885
Epoch 357/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4901
Epoch 358/1000

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13/13 [=====] - 0s 1ms/step - loss: 0.5085
Epoch 359/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5091
Epoch 360/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5016
Epoch 361/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5009
Epoch 362/1000
13/13 [=====] - 0s 2ms/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 3ms/step - loss: 0.4875
Epoch 368/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5087
Epoch 369/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4973
Epoch 370/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4983
Epoch 371/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4931
Epoch 372/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4857
Epoch 373/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4981
Epoch 374/1000
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.4865
Epoch 378/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.5396
Epoch 382/1000

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13/13 [=====] - 0s 3ms/step - loss: 0.5069
Epoch 383/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5307
Epoch 384/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4899
Epoch 385/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4973
Epoch 386/1000
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.4818
Epoch 391/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4857
Epoch 392/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4882
Epoch 393/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4835
Epoch 394/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4820
Epoch 395/1000
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.4918
Epoch 399/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4983
Epoch 400/1000
13/13 [=====] - 0s 2ms/step - loss: 0.5034
Epoch 401/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4922
Epoch 402/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4887
Epoch 403/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4894
Epoch 404/1000
13/13 [=====] - 0s 1ms/step - loss: 0.5069
Epoch 405/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4901
Epoch 406/1000

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13/13 [=====] - 0s 3ms/step - loss: 0.4851  
Epoch 407/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4993  
Epoch 408/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5236  
Epoch 409/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4846  
Epoch 410/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4871  
Epoch 411/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5102  
Epoch 412/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4781  
Epoch 413/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4878  
Epoch 414/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 2ms/step - loss: 0.4928  
Epoch 422/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4728  
Epoch 426/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4834  
Epoch 430/1000

13/13 [=====] - 0s 3ms/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  
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/step - loss: 0.4843  
Epoch 442/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4955  
Epoch 443/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4792  
Epoch 444/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4975  
Epoch 445/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5037  
Epoch 446/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5413  
Epoch 447/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5125  
Epoch 448/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5104  
Epoch 449/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4718  
Epoch 450/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4688  
Epoch 451/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4700  
Epoch 452/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4748  
Epoch 453/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4865  
Epoch 454/1000

13/13 [=====] - 0s 3ms/step - loss: 0.4990  
Epoch 455/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5044  
Epoch 456/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5010  
Epoch 457/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4604  
Epoch 458/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4743  
Epoch 459/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4600  
Epoch 460/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4704  
Epoch 461/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4734  
Epoch 462/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4620  
Epoch 466/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5179  
Epoch 467/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4669  
Epoch 468/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4898  
Epoch 469/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5280  
Epoch 470/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.5223  
Epoch 474/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.5189  
Epoch 482/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4660  
Epoch 483/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5081  
Epoch 484/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4698  
Epoch 485/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4998  
Epoch 486/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4739  
Epoch 487/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4748  
Epoch 488/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4635  
Epoch 489/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4543  
Epoch 490/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4666  
Epoch 491/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4733  
Epoch 492/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4962  
Epoch 493/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4731  
Epoch 494/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4574  
Epoch 495/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4664  
Epoch 496/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4773  
Epoch 497/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5681  
Epoch 498/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5085  
Epoch 499/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4731  
Epoch 500/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4930  
Epoch 501/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4552  
Epoch 502/1000

13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4980  
Epoch 506/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4696  
Epoch 510/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/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 1ms/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 2ms/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 2ms/step - loss: 0.4694  
Epoch 531/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4829  
Epoch 532/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4654  
Epoch 533/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4533  
Epoch 534/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4593  
Epoch 535/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4736  
Epoch 536/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4472  
Epoch 540/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4599  
Epoch 541/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5128  
Epoch 542/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4718  
Epoch 543/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4651  
Epoch 544/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4963  
Epoch 545/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4984  
Epoch 546/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4598  
Epoch 547/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4789  
Epoch 548/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4522  
Epoch 549/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4681  
Epoch 550/1000

13/13 [=====] - 0s 2ms/step - loss: 0.4607  
Epoch 551/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4528  
Epoch 555/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4524  
Epoch 559/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/step - loss: 0.4600  
Epoch 567/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.4613  
Epoch 572/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4779  
Epoch 573/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4621  
Epoch 574/1000

13/13 [=====] - 0s 2ms/step - loss: 0.4679  
Epoch 575/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4824  
Epoch 576/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4483  
Epoch 577/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4471  
Epoch 578/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5203  
Epoch 579/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4738  
Epoch 580/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4563  
Epoch 581/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4932  
Epoch 582/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4847  
Epoch 583/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4794  
Epoch 584/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4588  
Epoch 585/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4756  
Epoch 586/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4991  
Epoch 587/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4629  
Epoch 588/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4511  
Epoch 589/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4323  
Epoch 590/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4349  
Epoch 591/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4466  
Epoch 592/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4427  
Epoch 593/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4522  
Epoch 594/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4548  
Epoch 595/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4417  
Epoch 599/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4422  
Epoch 603/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/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 2ms/step - loss: 0.4537  
Epoch 615/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4697  
Epoch 616/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4668  
Epoch 617/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4403  
Epoch 618/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4591  
Epoch 619/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5116  
Epoch 620/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4663  
Epoch 621/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4548  
Epoch 622/1000

13/13 [=====] - 0s 2ms/step - loss: 0.4472  
Epoch 623/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4549  
Epoch 624/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4462  
Epoch 625/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4301  
Epoch 626/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4519  
Epoch 627/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4422  
Epoch 628/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4559  
Epoch 629/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4503  
Epoch 630/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4516  
Epoch 631/1000  
13/13 [=====] - 0s 3ms/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 3ms/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 2ms/step - loss: 0.4370  
Epoch 639/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.5074  
Epoch 643/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4901  
Epoch 647/1000  
13/13 [=====] - 0s 1ms/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 3ms/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 2ms/step - loss: 0.4530  
Epoch 655/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4660  
Epoch 656/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4401  
Epoch 660/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4729  
Epoch 661/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4400  
Epoch 662/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4430  
Epoch 663/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4699  
Epoch 664/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4648  
Epoch 665/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4427  
Epoch 666/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4661  
Epoch 667/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4525  
Epoch 668/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4363  
Epoch 669/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4520  
Epoch 670/1000

13/13 [=====] - 0s 2ms/step - loss: 0.4310  
 Epoch 671/1000  
 13/13 [=====] - 0s 3ms/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 1ms/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 1ms/step - loss: 0.4387  
 Epoch 679/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.4471  
 Epoch 680/1000  
 13/13 [=====] - 0s 3ms/step - loss: 0.4333  
 Epoch 681/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.4582  
 Epoch 682/1000  
 13/13 [=====] - 0s 1ms/step - loss: 0.4382  
 Epoch 683/1000  
 13/13 [=====] - 0s 2ms/step - loss: 0.4401  
 Epoch 684/1000  
 13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4322  
 Epoch 688/1000  
 13/13 [=====] - 0s 3ms/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 2ms/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 1ms/step - loss: 0.4336  
Epoch 696/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/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 1ms/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 2ms/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 2ms/step - loss: 0.4501  
Epoch 720/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4521  
Epoch 721/1000  
13/13 [=====] - 0s 1ms/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 1ms/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 2ms/step - loss: 0.4704  
Epoch 729/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.4180  
Epoch 733/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4271  
Epoch 734/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4488  
Epoch 735/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4186  
Epoch 736/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4248  
Epoch 737/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4305  
Epoch 738/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4641  
Epoch 739/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4604  
Epoch 740/1000  
13/13 [=====] - 0s 3ms/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 1ms/step - loss: 0.4214
Epoch 748/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4213
Epoch 749/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4994
Epoch 750/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4640
Epoch 751/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4234
Epoch 752/1000
13/13 [=====] - 0s 2ms/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 2ms/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 2ms/step - loss: 0.4645
Epoch 765/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4691
Epoch 766/1000

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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 2ms/step - loss: 0.4404  
Epoch 769/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 1ms/step - loss: 0.4567  
Epoch 776/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.4403  
Epoch 781/1000  
13/13 [=====] - 0s 3ms/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 2ms/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 2ms/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 2ms/step - loss: 0.5326  
Epoch 793/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4860  
Epoch 794/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5062  
Epoch 795/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5388  
Epoch 796/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4840  
Epoch 797/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.5376  
Epoch 798/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5497  
Epoch 799/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4734  
Epoch 800/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4402  
Epoch 801/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4257  
Epoch 802/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4150  
Epoch 803/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4158  
Epoch 804/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4205  
Epoch 805/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4295  
Epoch 806/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4292  
Epoch 807/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4171  
Epoch 808/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4304  
Epoch 809/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4788  
Epoch 810/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4305  
Epoch 811/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4141  
Epoch 812/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4169  
Epoch 813/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4223  
Epoch 814/1000

```

13/13 [=====] - 0s 1ms/step - loss: 0.4168
Epoch 815/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4443
Epoch 816/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4505
Epoch 817/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4518
Epoch 818/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4240
Epoch 819/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4227
Epoch 820/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4707
Epoch 821/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4487
Epoch 822/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4590
Epoch 823/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4653
Epoch 824/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4490
Epoch 825/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4270
Epoch 826/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4224
Epoch 827/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4151
Epoch 828/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4369
Epoch 829/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4180
Epoch 833/1000
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4484
Epoch 837/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4351
Epoch 838/1000

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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 2ms/step - loss: 0.4515  
Epoch 841/1000  
13/13 [=====] - 0s 3ms/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 2ms/step - loss: 0.4425  
Epoch 845/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4208  
Epoch 846/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4370  
Epoch 847/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4538  
Epoch 848/1000  
13/13 [=====] - 0s 2ms/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 2ms/step - loss: 0.4351  
Epoch 853/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4319  
Epoch 854/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4269  
Epoch 855/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4171  
Epoch 856/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4179  
Epoch 857/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4200  
Epoch 858/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4458  
Epoch 862/1000

13/13 [=====] - 0s 1ms/step - loss: 0.4490  
Epoch 863/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4100  
Epoch 864/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4665  
Epoch 865/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4699  
Epoch 866/1000  
13/13 [=====] - 0s 1ms/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 2ms/step - loss: 0.4149  
Epoch 870/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4555  
Epoch 871/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4461  
Epoch 872/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4055  
Epoch 873/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4015  
Epoch 874/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4146  
Epoch 875/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4233  
Epoch 879/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4197  
Epoch 880/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4269  
Epoch 881/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4417  
Epoch 882/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4555  
Epoch 883/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4783  
Epoch 884/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4646  
Epoch 885/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4510  
Epoch 886/1000

13/13 [=====] - 0s 3ms/step - loss: 0.4065  
Epoch 887/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4240  
Epoch 888/1000  
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.4140  
Epoch 892/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4319  
Epoch 893/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4683  
Epoch 894/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4260  
Epoch 895/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4523  
Epoch 896/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4118  
Epoch 897/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4270  
Epoch 898/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4296  
Epoch 899/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4432  
Epoch 900/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4243  
Epoch 901/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4281  
Epoch 902/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4253  
Epoch 903/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4413  
Epoch 904/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4084  
Epoch 905/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4166  
Epoch 906/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4271  
Epoch 907/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4333  
Epoch 908/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4262  
Epoch 909/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4665  
Epoch 910/1000



13/13 [=====] - 0s 3ms/step - loss: 0.4322  
Epoch 911/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4380  
Epoch 912/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4384  
Epoch 913/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4129  
Epoch 914/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4369  
Epoch 915/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4126  
Epoch 916/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.4501  
Epoch 926/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4430  
Epoch 927/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4677  
Epoch 928/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4154  
Epoch 929/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4102  
Epoch 930/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4601  
Epoch 931/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.5159  
Epoch 932/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5052  
Epoch 933/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4658  
Epoch 934/1000

13/13 [=====] - 0s 1ms/step - loss: 0.4520  
Epoch 935/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4250  
Epoch 936/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4249  
Epoch 937/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4062  
Epoch 938/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4344  
Epoch 939/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4334  
Epoch 940/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4134  
Epoch 941/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4028  
Epoch 942/1000  
13/13 [=====] - 0s 1ms/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 3ms/step - loss: 0.4228  
Epoch 946/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4177  
Epoch 947/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4441  
Epoch 948/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4412  
Epoch 949/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4108  
Epoch 950/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4060  
Epoch 951/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4017  
Epoch 952/1000  
13/13 [=====] - 0s 4ms/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 5ms/step - loss: 0.4277  
Epoch 956/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4673  
Epoch 957/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.5126  
Epoch 958/1000

13/13 [=====] - 0s 4ms/step - loss: 0.4279  
Epoch 959/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.4115  
Epoch 964/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4028  
Epoch 965/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4090  
Epoch 966/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4175  
Epoch 967/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4125  
Epoch 968/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4216  
Epoch 969/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4576  
Epoch 970/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4428  
Epoch 971/1000  
13/13 [=====] - 0s 3ms/step - loss: 0.4425  
Epoch 972/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4371  
Epoch 973/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4121  
Epoch 974/1000  
13/13 [=====] - 0s 2ms/step - loss: 0.4125  
Epoch 975/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4048  
Epoch 976/1000  
13/13 [=====] - 0s 1ms/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 1ms/step - loss: 0.4539  
Epoch 981/1000  
13/13 [=====] - 0s 1ms/step - loss: 0.4386  
Epoch 982/1000

```

13/13 [=====] - 0s 3ms/step - loss: 0.4308
Epoch 983/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4063
Epoch 984/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4202
Epoch 985/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4127
Epoch 986/1000
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.4064
Epoch 990/1000
13/13 [=====] - 0s 2ms/step - loss: 0.3948
Epoch 991/1000
13/13 [=====] - 0s 3ms/step - loss: 0.4166
Epoch 992/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4044
Epoch 993/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4087
Epoch 994/1000
13/13 [=====] - 0s 2ms/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 1ms/step - loss: 0.4396
Epoch 998/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4108
Epoch 999/1000
13/13 [=====] - 0s 2ms/step - loss: 0.4226
Epoch 1000/1000
13/13 [=====] - 0s 1ms/step - loss: 0.4581
Finished lambda = 0.3

```

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

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

*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' perfor-

mance.

```
[48]: 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', 'B
```

*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://lh3.google.com/u/0/d/14Xy\_Mb17CZVgzVAgq7NCjMVBvSae3x01" align="center" a