

# keras project

September 8, 2019

## 0.0.1 Import Libraries

```
[1]: import os
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import keras
from sklearn.preprocessing import StandardScaler
from sklearn.model_selection import train_test_split
from keras.models import Sequential
from keras.layers import Dense, Activation
from sklearn.metrics import mean_squared_error
%matplotlib inline
```

Using TensorFlow backend.

```
[2]: df = pd.read_csv("concrete_data.csv")
```

## 0.0.2 Data Exploration

```
[3]: df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1030 entries, 0 to 1029
Data columns (total 9 columns):
Cement                1030 non-null float64
Blast Furnace Slag    1030 non-null float64
Fly Ash               1030 non-null float64
Water                1030 non-null float64
Superplasticizer      1030 non-null float64
Coarse Aggregate      1030 non-null float64
Fine Aggregate        1030 non-null float64
Age                  1030 non-null int64
Strength              1030 non-null float64
dtypes: float64(8), int64(1)
memory usage: 72.5 KB
```

```
[4]: df.head()
```

```
[4]:      Cement  Blast Furnace Slag  Fly Ash  Water  Superplasticizer  \
0      540.0                0.0      0.0  162.0                2.5
1      540.0                0.0      0.0  162.0                2.5
2      332.5                142.5      0.0  228.0                0.0
3      332.5                142.5      0.0  228.0                0.0
4      198.6                132.4      0.0  192.0                0.0

      Coarse Aggregate  Fine Aggregate  Age  Strength
0                1040.0            676.0   28    79.99
1                1055.0            676.0   28    61.89
2                 932.0            594.0  270    40.27
3                 932.0            594.0  365    41.05
4                 978.4            825.5  360    44.30
```

```
[5]: df.tail()
```

```
[5]:      Cement  Blast Furnace Slag  Fly Ash  Water  Superplasticizer  \
1025    276.4                116.0     90.3  179.6                8.9
1026    322.2                0.0    115.6  196.0               10.4
1027    148.5                139.4    108.6  192.7                6.1
1028    159.1                186.7      0.0  175.6               11.3
1029    260.9                100.5     78.3  200.6                8.6

      Coarse Aggregate  Fine Aggregate  Age  Strength
1025                870.1            768.3   28    44.28
1026                817.9            813.4   28    31.18
1027                892.4            780.0   28    23.70
1028                989.6            788.9   28    32.77
1029                864.5            761.5   28    32.40
```

```
[6]: df.describe()
```

```
[6]:      Cement  Blast Furnace Slag  Fly Ash  Water  \
count  1030.000000      1030.000000  1030.000000  1030.000000
mean    281.167864       73.895825    54.188350   181.567282
std     104.506364       86.279342    63.997004    21.354219
min     102.000000        0.000000     0.000000   121.800000
25%     192.375000        0.000000     0.000000   164.900000
50%     272.900000       22.000000     0.000000   185.000000
75%     350.000000      142.950000    118.300000   192.000000
max     540.000000      359.400000    200.100000   247.000000

      Superplasticizer  Coarse Aggregate  Fine Aggregate  Age  \
count      1030.000000      1030.000000      1030.000000  1030.000000
mean         6.204660       972.918932       773.580485    45.662136
std          5.973841        77.753954        80.175980    63.169912
min           0.000000       801.000000       594.000000     1.000000
```

25%	0.000000	932.000000	730.950000	7.000000
50%	6.400000	968.000000	779.500000	28.000000
75%	10.200000	1029.400000	824.000000	56.000000
max	32.200000	1145.000000	992.600000	365.000000

	Strength
count	1030.000000
mean	35.817961
std	16.705742
min	2.330000
25%	23.710000
50%	34.445000
75%	46.135000
max	82.600000

```
[7]: df.dtypes
```

```
[7]: Cement                float64
Blast Furnace Slag        float64
Fly Ash                    float64
Water                     float64
Superplasticizer          float64
Coarse Aggregate          float64
Fine Aggregate            float64
Age                       int64
Strength                  float64
dtype: object
```

```
[8]: df.shape
```

```
[8]: (1030, 9)
```

```
[9]: df.columns
```

```
[9]: Index(['Cement', 'Blast Furnace Slag', 'Fly Ash', 'Water', 'Superplasticizer',
        'Coarse Aggregate', 'Fine Aggregate', 'Age', 'Strength'],
        dtype='object')
```

```
[10]: df.index
```

```
[10]: RangeIndex(start=0, stop=1030, step=1)
```

```
[11]: df.isnull().any()  #Any NULL values?
```

```
[11]: Cement                False
Blast Furnace Slag        False
Fly Ash                    False
Water                     False
Superplasticizer          False
Coarse Aggregate          False
Fine Aggregate            False
Age                       False
```

```
Strength          False
dtype: bool
```

```
[12]: df.corr() #Find correlation
```

```
[12]:
```

	Cement	Blast Furnace Slag	Fly Ash	Water	\
Cement	1.000000	-0.275216	-0.397467	-0.081587	
Blast Furnace Slag	-0.275216	1.000000	-0.323580	0.107252	
Fly Ash	-0.397467	-0.323580	1.000000	-0.256984	
Water	-0.081587	0.107252	-0.256984	1.000000	
Superplasticizer	0.092386	0.043270	0.377503	-0.657533	
Coarse Aggregate	-0.109349	-0.283999	-0.009961	-0.182294	
Fine Aggregate	-0.222718	-0.281603	0.079108	-0.450661	
Age	0.081946	-0.044246	-0.154371	0.277618	
Strength	0.497832	0.134829	-0.105755	-0.289633	

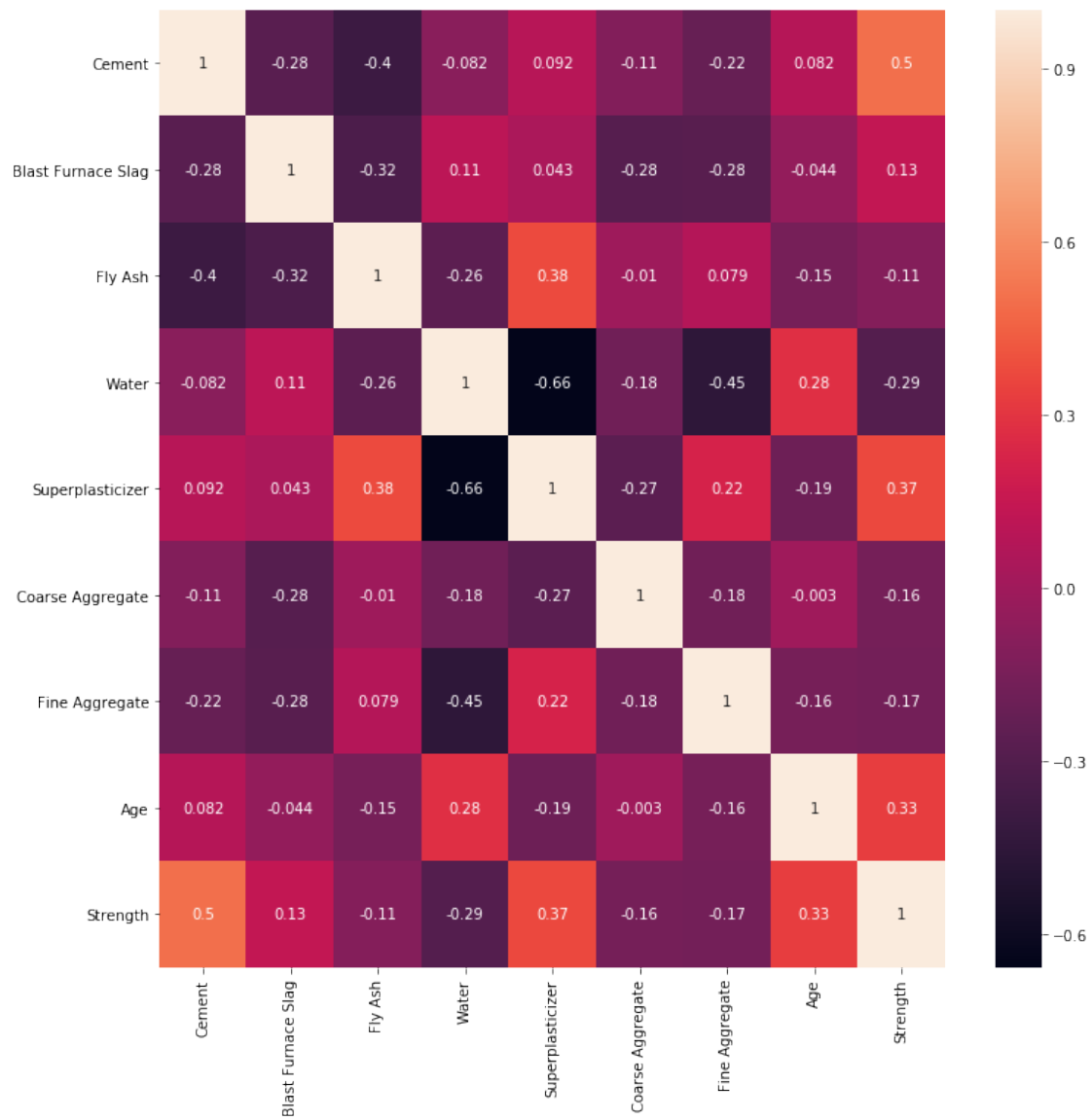
  

	Superplasticizer	Coarse Aggregate	Fine Aggregate	\
Cement	0.092386	-0.109349	-0.222718	
Blast Furnace Slag	0.043270	-0.283999	-0.281603	
Fly Ash	0.377503	-0.009961	0.079108	
Water	-0.657533	-0.182294	-0.450661	
Superplasticizer	1.000000	-0.265999	0.222691	
Coarse Aggregate	-0.265999	1.000000	-0.178481	
Fine Aggregate	0.222691	-0.178481	1.000000	
Age	-0.192700	-0.003016	-0.156095	
Strength	0.366079	-0.164935	-0.167241	

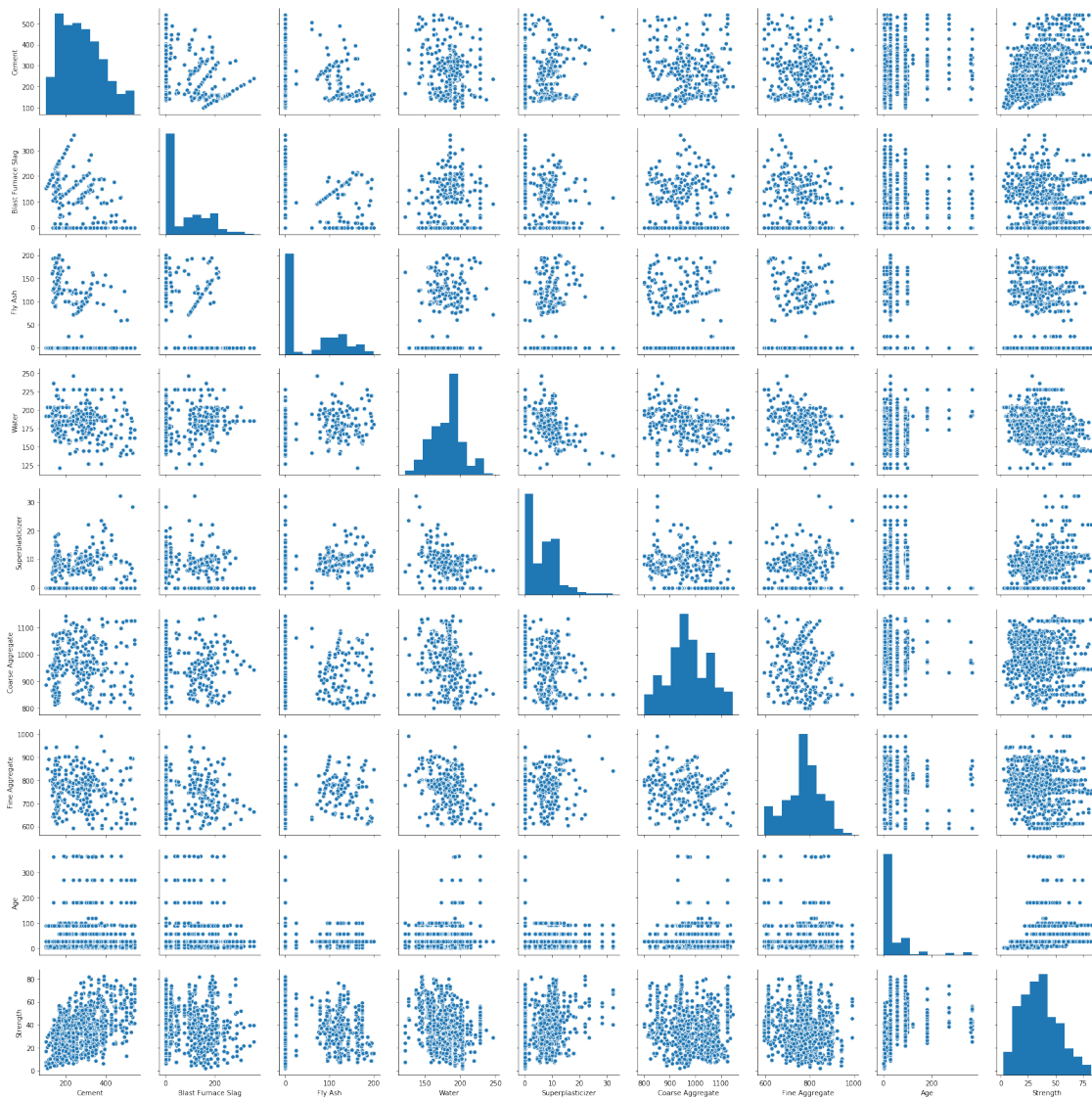
  

	Age	Strength
Cement	0.081946	0.497832
Blast Furnace Slag	-0.044246	0.134829
Fly Ash	-0.154371	-0.105755
Water	0.277618	-0.289633
Superplasticizer	-0.192700	0.366079
Coarse Aggregate	-0.003016	-0.164935
Fine Aggregate	-0.156095	-0.167241
Age	1.000000	0.328873
Strength	0.328873	1.000000

```
[13]: plt.figure(figsize=(12,12))
sns.heatmap(df.corr(),annot=True)
plt.show()
```



```
[14]: sns.pairplot(df)
plt.show()
```



### 0.0.3 Spilt the independant variables and target variable (Not Normalized)

X = 'Cement', 'Blast Furnace Slag', 'Fly Ash', 'Water', 'Superplasticizer', 'Coarse Aggregate', 'Fine Aggregate', 'Age' y = 'Strength'

```
[15]: X = df[['Cement', 'Blast Furnace Slag', 'Fly Ash', 'Water', 'Superplasticizer',  
          'Coarse Aggregate', 'Fine Aggregate', 'Age']]
```

```
[16]: y = df[['Strength']]
```

```
[17]: X.head()
```

```
[17]:   Cement  Blast Furnace Slag  Fly Ash  Water  Superplasticizer  \  
0    540.0                 0.0    0.0  162.0                2.5  
1    540.0                 0.0    0.0  162.0                2.5
```

2	332.5	142.5	0.0	228.0	0.0
3	332.5	142.5	0.0	228.0	0.0
4	198.6	132.4	0.0	192.0	0.0

	Coarse Aggregate	Fine Aggregate	Age
0	1040.0	676.0	28
1	1055.0	676.0	28
2	932.0	594.0	270
3	932.0	594.0	365
4	978.4	825.5	360

```
[18]: y.head()
```

```
[18]: Strength
0    79.99
1    61.89
2    40.27
3    41.05
4    44.30
```

```
[19]: #2nd way of normalizing
#X_norm = (X - X.mean()) / X.std()
#X_norm.head()
```

```
[20]: #X_norm.shape
```

```
[21]: #y_norm = (y - y.mean()) / y.std()
#y_norm.head()
```

```
[22]: df_columns = df.columns

predictors = df[df_columns[df_columns != 'Strength']] # all columns except
→Strength
target = df['Strength'] # Strength column
```

```
[23]: df_columns
```

```
[23]: Index(['Cement', 'Blast Furnace Slag', 'Fly Ash', 'Water', 'Superplasticizer',
        'Coarse Aggregate', 'Fine Aggregate', 'Age', 'Strength'],
        dtype='object')
```

```
[24]: predictors.head()
```

```
[24]: Cement  Blast Furnace Slag  Fly Ash  Water  Superplasticizer \
0    540.0                0.0      0.0  162.0                2.5
1    540.0                0.0      0.0  162.0                2.5
2    332.5                142.5      0.0  228.0                0.0
3    332.5                142.5      0.0  228.0                0.0
4    198.6                132.4      0.0  192.0                0.0
```

	Coarse Aggregate	Fine Aggregate	Age
0	1040.0	676.0	28

1	1055.0	676.0	28
2	932.0	594.0	270
3	932.0	594.0	365
4	978.4	825.5	360

```
[25]: target.head()
```

```
[25]: 0    79.99
      1    61.89
      2    40.27
      3    41.05
      4    44.30
      Name: Strength, dtype: float64
```

```
[26]: n_cols = predictors.shape[1]  #set the independant columns
```

```
[27]: n_cols
```

```
[27]: 8
```

#### 0.0.4 Train test split

```
[28]: X.shape
```

```
[28]: (1030, 8)
```

```
[29]: y.shape
```

```
[29]: (1030, 1)
```

```
[30]: X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3,
      ↪random_state=0)
```

```
[31]: X_train.shape
```

```
[31]: (721, 8)
```

```
[32]: X_test.shape
```

```
[32]: (309, 8)
```

```
[33]: y_train.shape
```

```
[33]: (721, 1)
```

#### 0.0.5 A. Build a baseline model

```
[34]: # define base model
      def baseline_model():
          # create model
          model = Sequential()
          model.add(Dense(10, input_dim=n_cols, activation='relu'))
          model.add(Dense(1))
          # Compile model
```



```
model.compile(loss='mean_squared_error', optimizer='adam')
return model
```

[35]: *#This is to test the baseline model first*

```
model = baseline_model()
model.fit(predictors,target,epochs=50)
```

WARNING:tensorflow:From C:\ProgramData\Anaconda3\lib\site-packages\keras\backend\tensorflow\_backend.py:66: The name tf.get\_default\_graph is deprecated. Please use tf.compat.v1.get\_default\_graph instead.

WARNING:tensorflow:From C:\ProgramData\Anaconda3\lib\site-packages\keras\backend\tensorflow\_backend.py:541: The name tf.placeholder is deprecated. Please use tf.compat.v1.placeholder instead.

WARNING:tensorflow:From C:\ProgramData\Anaconda3\lib\site-packages\keras\backend\tensorflow\_backend.py:4432: The name tf.random\_uniform is deprecated. Please use tf.random.uniform instead.

WARNING:tensorflow:From C:\ProgramData\Anaconda3\lib\site-packages\keras\optimizers.py:793: The name tf.train.Optimizer is deprecated. Please use tf.compat.v1.train.Optimizer instead.

WARNING:tensorflow:From C:\ProgramData\Anaconda3\lib\site-packages\keras\backend\tensorflow\_backend.py:1033: The name tf.assign\_add is deprecated. Please use tf.compat.v1.assign\_add instead.

WARNING:tensorflow:From C:\ProgramData\Anaconda3\lib\site-packages\keras\backend\tensorflow\_backend.py:1020: The name tf.assign is deprecated. Please use tf.compat.v1.assign instead.

```
Epoch 1/50
1030/1030 [=====] - 0s 212us/step - loss: 126474.7374
Epoch 2/50
1030/1030 [=====] - 0s 46us/step - loss: 40557.7443
Epoch 3/50
1030/1030 [=====] - 0s 30us/step - loss: 8827.0842
Epoch 4/50
1030/1030 [=====] - 0s 30us/step - loss: 1393.5045
Epoch 5/50
1030/1030 [=====] - 0s 30us/step - loss: 481.9984
Epoch 6/50
1030/1030 [=====] - 0s 46us/step - loss: 425.2078
Epoch 7/50
1030/1030 [=====] - 0s 30us/step - loss: 413.8515
Epoch 8/50
1030/1030 [=====] - 0s 46us/step - loss: 402.8430
Epoch 9/50
```

1030/1030 [=====] - 0s 30us/step - loss: 391.5309  
 Epoch 10/50  
 1030/1030 [=====] - 0s 45us/step - loss: 380.4712  
 Epoch 11/50  
 1030/1030 [=====] - 0s 30us/step - loss: 368.7819  
 Epoch 12/50  
 1030/1030 [=====] - 0s 46us/step - loss: 357.9214  
 Epoch 13/50  
 1030/1030 [=====] - 0s 30us/step - loss: 346.9820  
 Epoch 14/50  
 1030/1030 [=====] - 0s 46us/step - loss: 336.3042  
 Epoch 15/50  
 1030/1030 [=====] - 0s 30us/step - loss: 326.2086  
 Epoch 16/50  
 1030/1030 [=====] - 0s 46us/step - loss: 316.4952  
 Epoch 17/50  
 1030/1030 [=====] - 0s 46us/step - loss: 306.3396  
 Epoch 18/50  
 1030/1030 [=====] - 0s 46us/step - loss: 297.9758  
 Epoch 19/50  
 1030/1030 [=====] - 0s 46us/step - loss: 289.5091  
 Epoch 20/50  
 1030/1030 [=====] - 0s 45us/step - loss: 281.5697  
 Epoch 21/50  
 1030/1030 [=====] - 0s 30us/step - loss: 273.3370  
 Epoch 22/50  
 1030/1030 [=====] - 0s 30us/step - loss: 265.9925  
 Epoch 23/50  
 1030/1030 [=====] - 0s 46us/step - loss: 259.0418  
 Epoch 24/50  
 1030/1030 [=====] - 0s 30us/step - loss: 252.5989  
 Epoch 25/50  
 1030/1030 [=====] - 0s 30us/step - loss: 246.3485  
 Epoch 26/50  
 1030/1030 [=====] - 0s 46us/step - loss: 240.3486  
 Epoch 27/50  
 1030/1030 [=====] - 0s 30us/step - loss: 234.9264  
 Epoch 28/50  
 1030/1030 [=====] - 0s 30us/step - loss: 229.6025  
 Epoch 29/50  
 1030/1030 [=====] - 0s 46us/step - loss: 225.3768  
 Epoch 30/50  
 1030/1030 [=====] - 0s 30us/step - loss: 220.0803  
 Epoch 31/50  
 1030/1030 [=====] - 0s 46us/step - loss: 215.4003  
 Epoch 32/50  
 1030/1030 [=====] - 0s 30us/step - loss: 211.0335  
 Epoch 33/50

```

1030/1030 [=====] - 0s 46us/step - loss: 207.1955
Epoch 34/50
1030/1030 [=====] - 0s 30us/step - loss: 203.1622
Epoch 35/50
1030/1030 [=====] - 0s 30us/step - loss: 199.2006
Epoch 36/50
1030/1030 [=====] - 0s 46us/step - loss: 195.4619
Epoch 37/50
1030/1030 [=====] - 0s 46us/step - loss: 191.9889
Epoch 38/50
1030/1030 [=====] - 0s 30us/step - loss: 188.4441
Epoch 39/50
1030/1030 [=====] - 0s 30us/step - loss: 184.7737
Epoch 40/50
1030/1030 [=====] - 0s 46us/step - loss: 181.7410
Epoch 41/50
1030/1030 [=====] - 0s 30us/step - loss: 178.5343
Epoch 42/50
1030/1030 [=====] - 0s 30us/step - loss: 175.4827
Epoch 43/50
1030/1030 [=====] - 0s 46us/step - loss: 172.4991
Epoch 44/50
1030/1030 [=====] - 0s 30us/step - loss: 169.7070
Epoch 45/50
1030/1030 [=====] - 0s 46us/step - loss: 166.9027
Epoch 46/50
1030/1030 [=====] - 0s 46us/step - loss: 164.9768
Epoch 47/50
1030/1030 [=====] - 0s 46us/step - loss: 161.5682
Epoch 48/50
1030/1030 [=====] - 0s 46us/step - loss: 159.2629
Epoch 49/50
1030/1030 [=====] - 0s 46us/step - loss: 156.2390
Epoch 50/50
1030/1030 [=====] - 0s 46us/step - loss: 153.9530

```

[35]: <keras.callbacks.History at 0x1feac7f00f0>

```

[36]: model2 = baseline_model()
      model2.fit(X_train,y_train,epochs=50)

```

```

Epoch 1/50
721/721 [=====] - 0s 238us/step - loss: 95793.2753
Epoch 2/50
721/721 [=====] - 0s 43us/step - loss: 55046.0416
Epoch 3/50
721/721 [=====] - 0s 43us/step - loss: 30945.5006
Epoch 4/50

```

721/721 [=====] - 0s 43us/step - loss: 17232.5495  
Epoch 5/50  
721/721 [=====] - 0s 22us/step - loss: 9796.8660  
Epoch 6/50  
721/721 [=====] - 0s 22us/step - loss: 6215.7181  
Epoch 7/50  
721/721 [=====] - 0s 22us/step - loss: 4615.7474  
Epoch 8/50  
721/721 [=====] - 0s 43us/step - loss: 3997.5838  
Epoch 9/50  
721/721 [=====] - 0s 43us/step - loss: 3713.0804  
Epoch 10/50  
721/721 [=====] - 0s 22us/step - loss: 3519.2623  
Epoch 11/50  
721/721 [=====] - 0s 43us/step - loss: 3337.6662  
Epoch 12/50  
721/721 [=====] - 0s 43us/step - loss: 3134.6608  
Epoch 13/50  
721/721 [=====] - 0s 43us/step - loss: 2869.7664  
Epoch 14/50  
721/721 [=====] - 0s 43us/step - loss: 2613.4979  
Epoch 15/50  
721/721 [=====] - 0s 43us/step - loss: 2421.4191  
Epoch 16/50  
721/721 [=====] - 0s 65us/step - loss: 2258.4228  
Epoch 17/50  
721/721 [=====] - 0s 43us/step - loss: 2109.3414  
Epoch 18/50  
721/721 [=====] - 0s 22us/step - loss: 1968.2859  
Epoch 19/50  
721/721 [=====] - 0s 43us/step - loss: 1846.3513  
Epoch 20/50  
721/721 [=====] - 0s 43us/step - loss: 1739.8017  
Epoch 21/50  
721/721 [=====] - 0s 43us/step - loss: 1651.3334  
Epoch 22/50  
721/721 [=====] - 0s 43us/step - loss: 1559.8498  
Epoch 23/50  
721/721 [=====] - 0s 43us/step - loss: 1485.0095  
Epoch 24/50  
721/721 [=====] - 0s 65us/step - loss: 1422.4655  
Epoch 25/50  
721/721 [=====] - 0s 43us/step - loss: 1360.3831  
Epoch 26/50  
721/721 [=====] - 0s 43us/step - loss: 1300.0524  
Epoch 27/50  
721/721 [=====] - 0s 43us/step - loss: 1250.6231  
Epoch 28/50

```

721/721 [=====] - 0s 43us/step - loss: 1203.3822
Epoch 29/50
721/721 [=====] - 0s 43us/step - loss: 1160.7279
Epoch 30/50
721/721 [=====] - 0s 43us/step - loss: 1116.5589
Epoch 31/50
721/721 [=====] - 0s 43us/step - loss: 1077.2627
Epoch 32/50
721/721 [=====] - 0s 65us/step - loss: 1041.6794
Epoch 33/50
721/721 [=====] - 0s 43us/step - loss: 1007.0271
Epoch 34/50
721/721 [=====] - 0s 43us/step - loss: 979.3271
Epoch 35/50
721/721 [=====] - 0s 43us/step - loss: 948.4775
Epoch 36/50
721/721 [=====] - 0s 43us/step - loss: 921.4572
Epoch 37/50
721/721 [=====] - 0s 43us/step - loss: 889.5261
Epoch 38/50
721/721 [=====] - 0s 43us/step - loss: 864.9444
Epoch 39/50
721/721 [=====] - 0s 43us/step - loss: 838.6458
Epoch 40/50
721/721 [=====] - 0s 43us/step - loss: 816.5865
Epoch 41/50
721/721 [=====] - 0s 43us/step - loss: 794.6044
Epoch 42/50
721/721 [=====] - 0s 43us/step - loss: 772.2780
Epoch 43/50
721/721 [=====] - 0s 43us/step - loss: 753.8663
Epoch 44/50
721/721 [=====] - 0s 43us/step - loss: 732.9609
Epoch 45/50
721/721 [=====] - 0s 43us/step - loss: 715.9966
Epoch 46/50
721/721 [=====] - 0s 43us/step - loss: 697.3582
Epoch 47/50
721/721 [=====] - 0s 65us/step - loss: 679.9130
Epoch 48/50
721/721 [=====] - 0s 43us/step - loss: 663.4091
Epoch 49/50
721/721 [=====] - 0s 43us/step - loss: 646.1295
Epoch 50/50
721/721 [=====] - 0s 43us/step - loss: 631.6034

```

[36]: <keras.callbacks.History at 0x1feac1e75f8>

```
[37]: model2.summary()
```

```
Model: "sequential_2"
```

Layer (type)	Output Shape	Param #
dense_3 (Dense)	(None, 10)	90
dense_4 (Dense)	(None, 1)	11

Total params: 101  
Trainable params: 101  
Non-trainable params: 0

```
[38]: score = model2.evaluate(X_test,y_test)
```

```
309/309 [=====] - 0s 607us/step
```

```
[39]: print("Score is ",score,'%')
```

```
Score is 607.0687787201026 %
```

```
[40]: y_pred = model2.predict(X_test)
```

```
[41]: y_pred
```

```
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```

```
[42]: mean_squared_error(y_test,y_pred)
```

```
[42]: 607.0687630367254
```

### 0.0.6 Repeat 50 times for steps 1 to 3

```
[43]: l = []

for i in range(1,51):
    X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3,
    random_state=0)
    model2 = baseline_model()
    model2.fit(X_train,y_train,epochs=50)
    y_pred = model2.predict(X_test)
    mse = mean_squared_error(y_test,y_pred)
    l.append(mse)
```

```
Epoch 1/50
721/721 [=====] - 0s 325us/step - loss: 182918.0912
Epoch 2/50
721/721 [=====] - 0s 43us/step - loss: 76603.4363
Epoch 3/50
721/721 [=====] - 0s 43us/step - loss: 26548.3023
Epoch 4/50
721/721 [=====] - 0s 43us/step - loss: 7852.6798
Epoch 5/50
721/721 [=====] - 0s 43us/step - loss: 3220.1767
Epoch 6/50
721/721 [=====] - 0s 43us/step - loss: 2612.2493
Epoch 7/50
721/721 [=====] - 0s 43us/step - loss: 2486.4558
Epoch 8/50
721/721 [=====] - 0s 43us/step - loss: 2365.3266
Epoch 9/50
721/721 [=====] - 0s 43us/step - loss: 2239.7228
Epoch 10/50
721/721 [=====] - 0s 43us/step - loss: 2119.1160
Epoch 11/50
721/721 [=====] - 0s 43us/step - loss: 2006.3206
```

Epoch 12/50  
721/721 [=====] - 0s 43us/step - loss: 1898.7223  
Epoch 13/50  
721/721 [=====] - 0s 44us/step - loss: 1803.0359  
Epoch 14/50  
721/721 [=====] - 0s 43us/step - loss: 1719.2810  
Epoch 15/50  
721/721 [=====] - 0s 43us/step - loss: 1639.5702  
Epoch 16/50  
721/721 [=====] - 0s 43us/step - loss: 1568.7740  
Epoch 17/50  
721/721 [=====] - 0s 43us/step - loss: 1502.5630  
Epoch 18/50  
721/721 [=====] - 0s 43us/step - loss: 1442.3323  
Epoch 19/50  
721/721 [=====] - 0s 43us/step - loss: 1377.7867  
Epoch 20/50  
721/721 [=====] - 0s 43us/step - loss: 1321.4131  
Epoch 21/50  
721/721 [=====] - 0s 43us/step - loss: 1268.2070  
Epoch 22/50  
721/721 [=====] - 0s 43us/step - loss: 1216.4291  
Epoch 23/50  
721/721 [=====] - 0s 43us/step - loss: 1173.9227  
Epoch 24/50  
721/721 [=====] - 0s 43us/step - loss: 1132.2474  
Epoch 25/50  
721/721 [=====] - 0s 43us/step - loss: 1094.5606  
Epoch 26/50  
721/721 [=====] - 0s 43us/step - loss: 1057.2473  
Epoch 27/50  
721/721 [=====] - 0s 43us/step - loss: 1024.7759  
Epoch 28/50  
721/721 [=====] - 0s 43us/step - loss: 991.4061  
Epoch 29/50  
721/721 [=====] - 0s 43us/step - loss: 959.6516  
Epoch 30/50  
721/721 [=====] - 0s 22us/step - loss: 929.3052  
Epoch 31/50  
721/721 [=====] - 0s 43us/step - loss: 901.4640  
Epoch 32/50  
721/721 [=====] - 0s 43us/step - loss: 874.0115  
Epoch 33/50  
721/721 [=====] - 0s 43us/step - loss: 846.4629  
Epoch 34/50  
721/721 [=====] - 0s 43us/step - loss: 820.1258  
Epoch 35/50  
721/721 [=====] - 0s 65us/step - loss: 797.1975

Epoch 36/50  
721/721 [=====] - 0s 22us/step - loss: 772.8696  
Epoch 37/50  
721/721 [=====] - 0s 43us/step - loss: 747.7063  
Epoch 38/50  
721/721 [=====] - 0s 43us/step - loss: 722.6026  
Epoch 39/50  
721/721 [=====] - 0s 43us/step - loss: 699.4775  
Epoch 40/50  
721/721 [=====] - 0s 43us/step - loss: 677.6758  
Epoch 41/50  
721/721 [=====] - 0s 43us/step - loss: 659.6599  
Epoch 42/50  
721/721 [=====] - 0s 43us/step - loss: 638.7808  
Epoch 43/50  
721/721 [=====] - 0s 65us/step - loss: 620.0064  
Epoch 44/50  
721/721 [=====] - 0s 43us/step - loss: 605.1543  
Epoch 45/50  
721/721 [=====] - 0s 65us/step - loss: 589.1869  
Epoch 46/50  
721/721 [=====] - 0s 43us/step - loss: 570.6363  
Epoch 47/50  
721/721 [=====] - 0s 65us/step - loss: 556.7362  
Epoch 48/50  
721/721 [=====] - 0s 43us/step - loss: 543.1504  
Epoch 49/50  
721/721 [=====] - 0s 65us/step - loss: 529.9893  
Epoch 50/50  
721/721 [=====] - 0s 43us/step - loss: 518.0340  
Epoch 1/50  
721/721 [=====] - 0s 390us/step - loss: 868988.4617  
Epoch 2/50  
721/721 [=====] - 0s 65us/step - loss: 508189.9189  
Epoch 3/50  
721/721 [=====] - 0s 43us/step - loss: 290977.3026  
Epoch 4/50  
721/721 [=====] - 0s 43us/step - loss: 169442.4601  
Epoch 5/50  
721/721 [=====] - 0s 43us/step - loss: 99771.2881  
Epoch 6/50  
721/721 [=====] - 0s 43us/step - loss: 58897.6831  
Epoch 7/50  
721/721 [=====] - 0s 43us/step - loss: 35261.2381  
Epoch 8/50  
721/721 [=====] - 0s 43us/step - loss: 21630.4896  
Epoch 9/50  
721/721 [=====] - 0s 43us/step - loss: 14300.8072

Epoch 10/50  
721/721 [=====] - 0s 65us/step - loss: 10292.0170  
Epoch 11/50  
721/721 [=====] - 0s 43us/step - loss: 8268.8888  
Epoch 12/50  
721/721 [=====] - 0s 65us/step - loss: 7217.0053  
Epoch 13/50  
721/721 [=====] - 0s 43us/step - loss: 6649.2147  
Epoch 14/50  
721/721 [=====] - 0s 65us/step - loss: 6306.8552  
Epoch 15/50  
721/721 [=====] - 0s 22us/step - loss: 6072.0782  
Epoch 16/50  
721/721 [=====] - 0s 43us/step - loss: 5870.7080  
Epoch 17/50  
721/721 [=====] - 0s 43us/step - loss: 5692.6144  
Epoch 18/50  
721/721 [=====] - 0s 43us/step - loss: 5510.9009  
Epoch 19/50  
721/721 [=====] - 0s 65us/step - loss: 5330.0551  
Epoch 20/50  
721/721 [=====] - 0s 43us/step - loss: 5148.9024  
Epoch 21/50  
721/721 [=====] - 0s 65us/step - loss: 4968.9326  
Epoch 22/50  
721/721 [=====] - 0s 65us/step - loss: 4780.3012  
Epoch 23/50  
721/721 [=====] - 0s 43us/step - loss: 4595.6397  
Epoch 24/50  
721/721 [=====] - 0s 43us/step - loss: 4407.8821  
Epoch 25/50  
721/721 [=====] - 0s 65us/step - loss: 4224.0804  
Epoch 26/50  
721/721 [=====] - 0s 43us/step - loss: 4044.6136  
Epoch 27/50  
721/721 [=====] - 0s 50us/step - loss: 3864.9184  
Epoch 28/50  
721/721 [=====] - 0s 43us/step - loss: 3692.2969  
Epoch 29/50  
721/721 [=====] - 0s 65us/step - loss: 3523.2327  
Epoch 30/50  
721/721 [=====] - 0s 65us/step - loss: 3361.5997  
Epoch 31/50  
721/721 [=====] - 0s 43us/step - loss: 3197.5257  
Epoch 32/50  
721/721 [=====] - 0s 65us/step - loss: 3036.1038  
Epoch 33/50  
721/721 [=====] - 0s 43us/step - loss: 2883.7182



Epoch 34/50  
721/721 [=====] - 0s 65us/step - loss: 2738.9570  
Epoch 35/50  
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Epoch 36/50  
721/721 [=====] - 0s 65us/step - loss: 2461.0245  
Epoch 37/50  
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Epoch 38/50  
721/721 [=====] - 0s 43us/step - loss: 2215.1290  
Epoch 39/50  
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Epoch 40/50  
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Epoch 41/50  
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Epoch 43/50  
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Epoch 44/50  
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Epoch 45/50  
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Epoch 46/50  
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Epoch 47/50  
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721/721 [=====] - 0s 43us/step - loss: 2883.9726  
Epoch 13/50  
721/721 [=====] - 0s 43us/step - loss: 2656.4904  
Epoch 14/50  
721/721 [=====] - 0s 65us/step - loss: 2461.1865  
Epoch 15/50  
721/721 [=====] - 0s 43us/step - loss: 2268.6912  
Epoch 16/50  
721/721 [=====] - 0s 65us/step - loss: 2095.4041  
Epoch 17/50  
721/721 [=====] - 0s 65us/step - loss: 1939.4086  
Epoch 18/50  
721/721 [=====] - 0s 43us/step - loss: 1800.0794  
Epoch 19/50  
721/721 [=====] - 0s 43us/step - loss: 1674.0351  
Epoch 20/50  
721/721 [=====] - 0s 65us/step - loss: 1548.2425  
Epoch 21/50  
721/721 [=====] - 0s 65us/step - loss: 1442.4608  
Epoch 22/50  
721/721 [=====] - 0s 65us/step - loss: 1350.0997  
Epoch 23/50  
721/721 [=====] - 0s 43us/step - loss: 1261.0859  
Epoch 24/50  
721/721 [=====] - 0s 43us/step - loss: 1184.4778  
Epoch 25/50  
721/721 [=====] - 0s 43us/step - loss: 1113.8862  
Epoch 26/50  
721/721 [=====] - 0s 65us/step - loss: 1053.2616  
Epoch 27/50  
721/721 [=====] - 0s 43us/step - loss: 995.5221  
Epoch 28/50  
721/721 [=====] - 0s 43us/step - loss: 945.1675  
Epoch 29/50  
721/721 [=====] - 0s 43us/step - loss: 899.2039  
Epoch 30/50  
721/721 [=====] - 0s 43us/step - loss: 860.1701  
Epoch 31/50  
721/721 [=====] - 0s 65us/step - loss: 822.5664

Epoch 32/50  
721/721 [=====] - 0s 43us/step - loss: 789.4675  
Epoch 33/50  
721/721 [=====] - 0s 43us/step - loss: 760.8954  
Epoch 34/50  
721/721 [=====] - 0s 65us/step - loss: 732.4060  
Epoch 35/50  
721/721 [=====] - 0s 43us/step - loss: 708.8716  
Epoch 36/50  
721/721 [=====] - 0s 65us/step - loss: 687.9571  
Epoch 37/50  
721/721 [=====] - 0s 65us/step - loss: 665.7681  
Epoch 38/50  
721/721 [=====] - 0s 43us/step - loss: 647.8257  
Epoch 39/50  
721/721 [=====] - 0s 43us/step - loss: 631.5727  
Epoch 40/50  
721/721 [=====] - 0s 43us/step - loss: 615.5224  
Epoch 41/50  
721/721 [=====] - 0s 65us/step - loss: 602.0247  
Epoch 42/50  
721/721 [=====] - 0s 43us/step - loss: 587.3959  
Epoch 43/50  
721/721 [=====] - 0s 65us/step - loss: 578.0921  
Epoch 44/50  
721/721 [=====] - 0s 43us/step - loss: 563.4739  
Epoch 45/50  
721/721 [=====] - 0s 65us/step - loss: 553.5560  
Epoch 46/50  
721/721 [=====] - 0s 43us/step - loss: 541.2619  
Epoch 47/50  
721/721 [=====] - 0s 43us/step - loss: 531.6608  
Epoch 48/50  
721/721 [=====] - 0s 65us/step - loss: 523.1025  
Epoch 49/50  
721/721 [=====] - 0s 43us/step - loss: 515.5663  
Epoch 50/50  
721/721 [=====] - 0s 65us/step - loss: 505.3597  
Epoch 1/50  
721/721 [=====] - 0s 412us/step - loss: 328902.2432  
Epoch 2/50  
721/721 [=====] - 0s 43us/step - loss: 211588.3239  
Epoch 3/50  
721/721 [=====] - 0s 43us/step - loss: 141690.6592  
Epoch 4/50  
721/721 [=====] - 0s 43us/step - loss: 98694.2228  
Epoch 5/50  
721/721 [=====] - 0s 43us/step - loss: 71794.4771

Epoch 6/50  
721/721 [=====] - 0s 43us/step - loss: 54410.6080  
Epoch 7/50  
721/721 [=====] - 0s 43us/step - loss: 42717.6361  
Epoch 8/50  
721/721 [=====] - 0s 43us/step - loss: 34328.3853  
Epoch 9/50  
721/721 [=====] - 0s 65us/step - loss: 27995.6190  
Epoch 10/50  
721/721 [=====] - 0s 65us/step - loss: 23100.9345  
Epoch 11/50  
721/721 [=====] - 0s 43us/step - loss: 19232.3537  
Epoch 12/50  
721/721 [=====] - 0s 65us/step - loss: 16093.9819  
Epoch 13/50  
721/721 [=====] - 0s 43us/step - loss: 13574.6553  
Epoch 14/50  
721/721 [=====] - 0s 65us/step - loss: 11529.9463  
Epoch 15/50  
721/721 [=====] - 0s 65us/step - loss: 9853.5456  
Epoch 16/50  
721/721 [=====] - 0s 43us/step - loss: 8503.2533  
Epoch 17/50  
721/721 [=====] - 0s 43us/step - loss: 7400.2091  
Epoch 18/50  
721/721 [=====] - 0s 43us/step - loss: 6487.5313  
Epoch 19/50  
721/721 [=====] - 0s 65us/step - loss: 5753.4738  
Epoch 20/50  
721/721 [=====] - 0s 43us/step - loss: 5158.3298  
Epoch 21/50  
721/721 [=====] - 0s 43us/step - loss: 4680.5830  
Epoch 22/50  
721/721 [=====] - 0s 65us/step - loss: 4303.3179  
Epoch 23/50  
721/721 [=====] - 0s 65us/step - loss: 3988.8274  
Epoch 24/50  
721/721 [=====] - ETA: 0s - loss: 3933.70 - 0s  
43us/step - loss: 3723.5613  
Epoch 25/50  
721/721 [=====] - 0s 65us/step - loss: 3500.3159  
Epoch 26/50  
721/721 [=====] - 0s 65us/step - loss: 3308.5445  
Epoch 27/50  
721/721 [=====] - 0s 65us/step - loss: 3145.0984  
Epoch 28/50  
721/721 [=====] - 0s 65us/step - loss: 2998.3480  
Epoch 29/50

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721/721 [=====] - 0s 43us/step - loss: 2873.3726
Epoch 30/50
721/721 [=====] - 0s 43us/step - loss: 2765.2604
Epoch 31/50
721/721 [=====] - 0s 65us/step - loss: 2670.1348
Epoch 32/50
721/721 [=====] - 0s 43us/step - loss: 2580.6656
Epoch 33/50
721/721 [=====] - 0s 65us/step - loss: 2498.5202
Epoch 34/50
721/721 [=====] - 0s 43us/step - loss: 2423.7639
Epoch 35/50
721/721 [=====] - 0s 43us/step - loss: 2351.4061
Epoch 36/50
721/721 [=====] - 0s 43us/step - loss: 2289.0951
Epoch 37/50
721/721 [=====] - 0s 46us/step - loss: 2230.8812
Epoch 38/50
721/721 [=====] - 0s 43us/step - loss: 2178.6394
Epoch 39/50
721/721 [=====] - 0s 43us/step - loss: 2131.8871
Epoch 40/50
721/721 [=====] - 0s 43us/step - loss: 2087.0724
Epoch 41/50
721/721 [=====] - 0s 65us/step - loss: 2045.2740
Epoch 42/50
721/721 [=====] - 0s 43us/step - loss: 2009.3160
Epoch 43/50
721/721 [=====] - 0s 65us/step - loss: 1975.4429
Epoch 44/50
721/721 [=====] - 0s 43us/step - loss: 1944.9174
Epoch 45/50
721/721 [=====] - 0s 43us/step - loss: 1916.7501
Epoch 46/50
721/721 [=====] - 0s 43us/step - loss: 1890.3293
Epoch 47/50
721/721 [=====] - 0s 43us/step - loss: 1867.1690
Epoch 48/50
721/721 [=====] - ETA: 0s - loss: 1811.70 - 0s
43us/step - loss: 1846.0184
Epoch 49/50
721/721 [=====] - 0s 43us/step - loss: 1825.7604
Epoch 50/50
721/721 [=====] - 0s 65us/step - loss: 1808.2870
Epoch 1/50
721/721 [=====] - 0s 498us/step - loss: 213269.6631
Epoch 2/50
721/721 [=====] - 0s 43us/step - loss: 97332.3970

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Epoch 3/50  
721/721 [=====] - 0s 43us/step - loss: 36497.1714  
Epoch 4/50  
721/721 [=====] - 0s 65us/step - loss: 13288.6849  
Epoch 5/50  
721/721 [=====] - 0s 43us/step - loss: 7064.0903  
Epoch 6/50  
721/721 [=====] - 0s 43us/step - loss: 5827.3169  
Epoch 7/50  
721/721 [=====] - 0s 65us/step - loss: 5347.5107  
Epoch 8/50  
721/721 [=====] - 0s 43us/step - loss: 4935.6044  
Epoch 9/50  
721/721 [=====] - 0s 43us/step - loss: 4508.8600  
Epoch 10/50  
721/721 [=====] - 0s 43us/step - loss: 4105.6227  
Epoch 11/50  
721/721 [=====] - 0s 65us/step - loss: 3648.5571  
Epoch 12/50  
721/721 [=====] - 0s 65us/step - loss: 3029.0471  
Epoch 13/50  
721/721 [=====] - 0s 43us/step - loss: 2366.4873  
Epoch 14/50  
721/721 [=====] - 0s 65us/step - loss: 1799.0912  
Epoch 15/50  
721/721 [=====] - 0s 43us/step - loss: 1409.4279  
Epoch 16/50  
721/721 [=====] - 0s 43us/step - loss: 1136.3692  
Epoch 17/50  
721/721 [=====] - 0s 43us/step - loss: 922.5859  
Epoch 18/50  
721/721 [=====] - 0s 43us/step - loss: 757.9965  
Epoch 19/50  
721/721 [=====] - 0s 43us/step - loss: 627.0097  
Epoch 20/50  
721/721 [=====] - 0s 43us/step - loss: 521.8226  
Epoch 21/50  
721/721 [=====] - 0s 43us/step - loss: 428.7025  
Epoch 22/50  
721/721 [=====] - 0s 43us/step - loss: 364.3061  
Epoch 23/50  
721/721 [=====] - 0s 43us/step - loss: 315.4837  
Epoch 24/50  
721/721 [=====] - 0s 43us/step - loss: 275.4036  
Epoch 25/50  
721/721 [=====] - 0s 43us/step - loss: 246.5642  
Epoch 26/50  
721/721 [=====] - 0s 65us/step - loss: 221.0704

Epoch 27/50  
721/721 [=====] - 0s 43us/step - loss: 202.8358  
Epoch 28/50  
721/721 [=====] - 0s 43us/step - loss: 190.5563  
Epoch 29/50  
721/721 [=====] - 0s 65us/step - loss: 178.2387  
Epoch 30/50  
721/721 [=====] - 0s 43us/step - loss: 168.9032  
Epoch 31/50  
721/721 [=====] - 0s 43us/step - loss: 163.1906  
Epoch 32/50  
721/721 [=====] - 0s 43us/step - loss: 156.5213  
Epoch 33/50  
721/721 [=====] - 0s 43us/step - loss: 152.9057  
Epoch 34/50  
721/721 [=====] - 0s 65us/step - loss: 149.0707  
Epoch 35/50  
721/721 [=====] - 0s 43us/step - loss: 145.3300  
Epoch 36/50  
721/721 [=====] - 0s 65us/step - loss: 142.8769  
Epoch 37/50  
721/721 [=====] - 0s 43us/step - loss: 140.9318  
Epoch 38/50  
721/721 [=====] - 0s 43us/step - loss: 139.7277  
Epoch 39/50  
721/721 [=====] - 0s 65us/step - loss: 137.5678  
Epoch 40/50  
721/721 [=====] - 0s 43us/step - loss: 136.3746  
Epoch 41/50  
721/721 [=====] - 0s 43us/step - loss: 136.8790  
Epoch 42/50  
721/721 [=====] - 0s 43us/step - loss: 135.0183  
Epoch 43/50  
721/721 [=====] - 0s 65us/step - loss: 132.5025  
Epoch 44/50  
721/721 [=====] - 0s 43us/step - loss: 136.5603  
Epoch 45/50  
721/721 [=====] - 0s 65us/step - loss: 133.2571  
Epoch 46/50  
721/721 [=====] - 0s 43us/step - loss: 131.7855  
Epoch 47/50  
721/721 [=====] - 0s 65us/step - loss: 131.0963  
Epoch 48/50  
721/721 [=====] - 0s 43us/step - loss: 129.5644  
Epoch 49/50  
721/721 [=====] - 0s 65us/step - loss: 128.8759  
Epoch 50/50  
721/721 [=====] - 0s 43us/step - loss: 128.1898

Epoch 1/50  
721/721 [=====] - 0s 498us/step - loss: 50743.3415  
Epoch 2/50  
721/721 [=====] - 0s 43us/step - loss: 17478.6424  
Epoch 3/50  
721/721 [=====] - 0s 65us/step - loss: 4585.5809  
Epoch 4/50  
721/721 [=====] - 0s 43us/step - loss: 1958.0913  
Epoch 5/50  
721/721 [=====] - 0s 65us/step - loss: 1710.7288  
Epoch 6/50  
721/721 [=====] - 0s 44us/step - loss: 1589.4550  
Epoch 7/50  
721/721 [=====] - 0s 43us/step - loss: 1483.2878  
Epoch 8/50  
721/721 [=====] - 0s 43us/step - loss: 1386.6013  
Epoch 9/50  
721/721 [=====] - 0s 43us/step - loss: 1309.8955  
Epoch 10/50  
721/721 [=====] - 0s 43us/step - loss: 1233.8145  
Epoch 11/50  
721/721 [=====] - 0s 22us/step - loss: 1163.2095  
Epoch 12/50  
721/721 [=====] - 0s 65us/step - loss: 1100.5380  
Epoch 13/50  
721/721 [=====] - 0s 43us/step - loss: 1047.2540  
Epoch 14/50  
721/721 [=====] - 0s 65us/step - loss: 996.3253  
Epoch 15/50  
721/721 [=====] - 0s 43us/step - loss: 951.7630  
Epoch 16/50  
721/721 [=====] - 0s 43us/step - loss: 912.6191  
Epoch 17/50  
721/721 [=====] - 0s 43us/step - loss: 873.9434  
Epoch 18/50  
721/721 [=====] - 0s 43us/step - loss: 838.1303  
Epoch 19/50  
721/721 [=====] - 0s 65us/step - loss: 804.8245  
Epoch 20/50  
721/721 [=====] - 0s 43us/step - loss: 776.9107  
Epoch 21/50  
721/721 [=====] - 0s 65us/step - loss: 750.8481  
Epoch 22/50  
721/721 [=====] - 0s 43us/step - loss: 718.5177  
Epoch 23/50  
721/721 [=====] - 0s 22us/step - loss: 691.3004  
Epoch 24/50  
721/721 [=====] - 0s 65us/step - loss: 666.6487



Epoch 25/50  
721/721 [=====] - 0s 43us/step - loss: 645.2723  
Epoch 26/50  
721/721 [=====] - 0s 43us/step - loss: 622.8630  
Epoch 27/50  
721/721 [=====] - 0s 65us/step - loss: 604.1882  
Epoch 28/50  
721/721 [=====] - 0s 65us/step - loss: 584.6533  
Epoch 29/50  
721/721 [=====] - 0s 43us/step - loss: 568.6133  
Epoch 30/50  
721/721 [=====] - 0s 65us/step - loss: 552.3142  
Epoch 31/50  
721/721 [=====] - 0s 43us/step - loss: 534.8436  
Epoch 32/50  
721/721 [=====] - 0s 65us/step - loss: 521.0139  
Epoch 33/50  
721/721 [=====] - 0s 43us/step - loss: 508.4524  
Epoch 34/50  
721/721 [=====] - 0s 65us/step - loss: 494.8744  
Epoch 35/50  
721/721 [=====] - 0s 43us/step - loss: 481.5456  
Epoch 36/50  
721/721 [=====] - 0s 65us/step - loss: 472.0457  
Epoch 37/50  
721/721 [=====] - 0s 22us/step - loss: 459.0904  
Epoch 38/50  
721/721 [=====] - 0s 43us/step - loss: 447.5104  
Epoch 39/50  
721/721 [=====] - 0s 65us/step - loss: 438.1273  
Epoch 40/50  
721/721 [=====] - 0s 43us/step - loss: 428.6791  
Epoch 41/50  
721/721 [=====] - 0s 43us/step - loss: 417.3229  
Epoch 42/50  
721/721 [=====] - 0s 43us/step - loss: 408.3813  
Epoch 43/50  
721/721 [=====] - 0s 65us/step - loss: 401.0359  
Epoch 44/50  
721/721 [=====] - 0s 43us/step - loss: 391.5397  
Epoch 45/50  
721/721 [=====] - 0s 43us/step - loss: 382.8855  
Epoch 46/50  
721/721 [=====] - 0s 43us/step - loss: 378.0439  
Epoch 47/50  
721/721 [=====] - 0s 43us/step - loss: 368.5031  
Epoch 48/50  
721/721 [=====] - 0s 43us/step - loss: 363.1137

Epoch 49/50  
721/721 [=====] - 0s 43us/step - loss: 352.9669  
Epoch 50/50  
721/721 [=====] - 0s 65us/step - loss: 346.4822  
Epoch 1/50  
721/721 [=====] - 0s 520us/step - loss: 2130.7255  
Epoch 2/50  
721/721 [=====] - 0s 43us/step - loss: 973.6805  
Epoch 3/50  
721/721 [=====] - 0s 65us/step - loss: 647.6227  
Epoch 4/50  
721/721 [=====] - 0s 43us/step - loss: 539.8719  
Epoch 5/50  
721/721 [=====] - 0s 43us/step - loss: 477.0013  
Epoch 6/50  
721/721 [=====] - 0s 43us/step - loss: 437.4141  
Epoch 7/50  
721/721 [=====] - 0s 43us/step - loss: 406.2138  
Epoch 8/50  
721/721 [=====] - 0s 43us/step - loss: 377.4121  
Epoch 9/50  
721/721 [=====] - 0s 43us/step - loss: 355.3816  
Epoch 10/50  
721/721 [=====] - 0s 43us/step - loss: 332.2052  
Epoch 11/50  
721/721 [=====] - 0s 65us/step - loss: 312.0965  
Epoch 12/50  
721/721 [=====] - 0s 43us/step - loss: 298.3456  
Epoch 13/50  
721/721 [=====] - 0s 43us/step - loss: 274.8464  
Epoch 14/50  
721/721 [=====] - 0s 43us/step - loss: 261.0747  
Epoch 15/50  
721/721 [=====] - ETA: 0s - loss: 250.114 - 0s  
43us/step - loss: 246.6357  
Epoch 16/50  
721/721 [=====] - 0s 43us/step - loss: 234.0908  
Epoch 17/50  
721/721 [=====] - 0s 40us/step - loss: 220.3091  
Epoch 18/50  
721/721 [=====] - 0s 43us/step - loss: 210.3880  
Epoch 19/50  
721/721 [=====] - 0s 43us/step - loss: 199.0524  
Epoch 20/50  
721/721 [=====] - 0s 43us/step - loss: 189.9907  
Epoch 21/50  
721/721 [=====] - 0s 65us/step - loss: 182.4261  
Epoch 22/50

721/721 [=====] - 0s 43us/step - loss: 176.3217  
Epoch 23/50  
721/721 [=====] - 0s 43us/step - loss: 167.3863  
Epoch 24/50  
721/721 [=====] - 0s 65us/step - loss: 163.8269  
Epoch 25/50  
721/721 [=====] - 0s 43us/step - loss: 158.2761  
Epoch 26/50  
721/721 [=====] - 0s 43us/step - loss: 155.2572  
Epoch 27/50  
721/721 [=====] - 0s 43us/step - loss: 153.5880  
Epoch 28/50  
721/721 [=====] - 0s 43us/step - loss: 145.7685  
Epoch 29/50  
721/721 [=====] - 0s 43us/step - loss: 141.8709  
Epoch 30/50  
721/721 [=====] - 0s 43us/step - loss: 139.0483  
Epoch 31/50  
721/721 [=====] - 0s 43us/step - loss: 138.1229  
Epoch 32/50  
721/721 [=====] - 0s 65us/step - loss: 135.0431  
Epoch 33/50  
721/721 [=====] - 0s 43us/step - loss: 134.7700  
Epoch 34/50  
721/721 [=====] - 0s 43us/step - loss: 132.2930  
Epoch 35/50  
721/721 [=====] - 0s 43us/step - loss: 134.4803  
Epoch 36/50  
721/721 [=====] - 0s 22us/step - loss: 127.9496  
Epoch 37/50  
721/721 [=====] - 0s 65us/step - loss: 129.0885  
Epoch 38/50  
721/721 [=====] - 0s 43us/step - loss: 134.5243  
Epoch 39/50  
721/721 [=====] - 0s 43us/step - loss: 126.3083  
Epoch 40/50  
721/721 [=====] - 0s 43us/step - loss: 124.1117  
Epoch 41/50  
721/721 [=====] - 0s 65us/step - loss: 123.4447  
Epoch 42/50  
721/721 [=====] - 0s 43us/step - loss: 122.3778  
Epoch 43/50  
721/721 [=====] - 0s 43us/step - loss: 124.2089  
Epoch 44/50  
721/721 [=====] - 0s 43us/step - loss: 122.6495  
Epoch 45/50  
721/721 [=====] - 0s 43us/step - loss: 121.1113  
Epoch 46/50

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721/721 [=====] - 0s 65us/step - loss: 120.1456
Epoch 47/50
721/721 [=====] - 0s 43us/step - loss: 121.1283
Epoch 48/50
721/721 [=====] - 0s 43us/step - loss: 120.3758
Epoch 49/50
721/721 [=====] - 0s 43us/step - loss: 118.8750
Epoch 50/50
721/721 [=====] - 0s 65us/step - loss: 118.9406
Epoch 1/50
721/721 [=====] - 0s 542us/step - loss: 126637.2364
Epoch 2/50
721/721 [=====] - 0s 43us/step - loss: 67821.1115
Epoch 3/50
721/721 [=====] - 0s 65us/step - loss: 31950.0435
Epoch 4/50
721/721 [=====] - 0s 22us/step - loss: 13029.6108
Epoch 5/50
721/721 [=====] - 0s 65us/step - loss: 4633.9919
Epoch 6/50
721/721 [=====] - 0s 43us/step - loss: 1661.5125
Epoch 7/50
721/721 [=====] - 0s 43us/step - loss: 855.7514
Epoch 8/50
721/721 [=====] - 0s 65us/step - loss: 679.0137
Epoch 9/50
721/721 [=====] - 0s 43us/step - loss: 637.0197
Epoch 10/50
721/721 [=====] - 0s 43us/step - loss: 616.4086
Epoch 11/50
721/721 [=====] - 0s 65us/step - loss: 592.8178
Epoch 12/50
721/721 [=====] - 0s 43us/step - loss: 572.8143
Epoch 13/50
721/721 [=====] - 0s 65us/step - loss: 549.5523
Epoch 14/50
721/721 [=====] - 0s 43us/step - loss: 527.5738
Epoch 15/50
721/721 [=====] - 0s 43us/step - loss: 505.7242
Epoch 16/50
721/721 [=====] - 0s 65us/step - loss: 483.2412
Epoch 17/50
721/721 [=====] - 0s 65us/step - loss: 459.2938
Epoch 18/50
721/721 [=====] - 0s 43us/step - loss: 434.7073
Epoch 19/50
721/721 [=====] - 0s 43us/step - loss: 407.2103
Epoch 20/50

```

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721/721 [=====] - 0s 43us/step - loss: 377.2468
Epoch 21/50
721/721 [=====] - 0s 43us/step - loss: 348.1089
Epoch 22/50
721/721 [=====] - 0s 43us/step - loss: 318.7456
Epoch 23/50
721/721 [=====] - 0s 43us/step - loss: 297.0654
Epoch 24/50
721/721 [=====] - 0s 43us/step - loss: 279.8421
Epoch 25/50
721/721 [=====] - 0s 43us/step - loss: 269.4357
Epoch 26/50
721/721 [=====] - 0s 65us/step - loss: 261.4099
Epoch 27/50
721/721 [=====] - 0s 43us/step - loss: 255.5994
Epoch 28/50
721/721 [=====] - 0s 65us/step - loss: 250.8370
Epoch 29/50
721/721 [=====] - 0s 43us/step - loss: 245.9221
Epoch 30/50
721/721 [=====] - 0s 44us/step - loss: 241.8239
Epoch 31/50
721/721 [=====] - 0s 43us/step - loss: 236.8540
Epoch 32/50
721/721 [=====] - 0s 43us/step - loss: 233.0241
Epoch 33/50
721/721 [=====] - 0s 65us/step - loss: 228.2165
Epoch 34/50
721/721 [=====] - 0s 43us/step - loss: 224.1595
Epoch 35/50
721/721 [=====] - 0s 43us/step - loss: 220.2923
Epoch 36/50
721/721 [=====] - 0s 65us/step - loss: 216.4893
Epoch 37/50
721/721 [=====] - 0s 43us/step - loss: 213.2955
Epoch 38/50
721/721 [=====] - 0s 43us/step - loss: 210.0389
Epoch 39/50
721/721 [=====] - 0s 43us/step - loss: 206.0842
Epoch 40/50
721/721 [=====] - 0s 43us/step - loss: 202.8380
Epoch 41/50
721/721 [=====] - 0s 43us/step - loss: 199.7133
Epoch 42/50
721/721 [=====] - 0s 43us/step - loss: 196.3372
Epoch 43/50
721/721 [=====] - 0s 43us/step - loss: 193.6324
Epoch 44/50

```

721/721 [=====] - 0s 43us/step - loss: 190.6791  
Epoch 45/50  
721/721 [=====] - 0s 43us/step - loss: 187.8541  
Epoch 46/50  
721/721 [=====] - 0s 43us/step - loss: 185.2324  
Epoch 47/50  
721/721 [=====] - 0s 43us/step - loss: 182.6096  
Epoch 48/50  
721/721 [=====] - 0s 43us/step - loss: 180.0280  
Epoch 49/50  
721/721 [=====] - 0s 65us/step - loss: 177.9342  
Epoch 50/50  
721/721 [=====] - 0s 43us/step - loss: 175.3508  
Epoch 1/50  
721/721 [=====] - 0s 520us/step - loss: 9008.8307  
Epoch 2/50  
721/721 [=====] - 0s 65us/step - loss: 4610.5506  
Epoch 3/50  
721/721 [=====] - 0s 43us/step - loss: 4026.4573  
Epoch 4/50  
721/721 [=====] - 0s 43us/step - loss: 3518.2607  
Epoch 5/50  
721/721 [=====] - 0s 43us/step - loss: 3129.4167  
Epoch 6/50  
721/721 [=====] - 0s 65us/step - loss: 2802.8968  
Epoch 7/50  
721/721 [=====] - 0s 43us/step - loss: 2521.4259  
Epoch 8/50  
721/721 [=====] - 0s 43us/step - loss: 2301.3088  
Epoch 9/50  
721/721 [=====] - 0s 43us/step - loss: 2099.0589  
Epoch 10/50  
721/721 [=====] - 0s 43us/step - loss: 1924.3228  
Epoch 11/50  
721/721 [=====] - 0s 43us/step - loss: 1765.8814  
Epoch 12/50  
721/721 [=====] - 0s 43us/step - loss: 1639.1000  
Epoch 13/50  
721/721 [=====] - 0s 65us/step - loss: 1516.1230  
Epoch 14/50  
721/721 [=====] - 0s 43us/step - loss: 1400.9742  
Epoch 15/50  
721/721 [=====] - 0s 44us/step - loss: 1306.2667  
Epoch 16/50  
721/721 [=====] - 0s 43us/step - loss: 1227.5255  
Epoch 17/50  
721/721 [=====] - 0s 43us/step - loss: 1143.9551  
Epoch 18/50

721/721 [=====] - 0s 43us/step - loss: 1074.7630  
 Epoch 19/50  
 721/721 [=====] - 0s 43us/step - loss: 1008.8526  
 Epoch 20/50  
 721/721 [=====] - 0s 43us/step - loss: 952.8876  
 Epoch 21/50  
 721/721 [=====] - 0s 43us/step - loss: 901.3956  
 Epoch 22/50  
 721/721 [=====] - 0s 43us/step - loss: 853.1214  
 Epoch 23/50  
 721/721 [=====] - 0s 43us/step - loss: 804.0602  
 Epoch 24/50  
 721/721 [=====] - 0s 43us/step - loss: 764.7186  
 Epoch 25/50  
 721/721 [=====] - 0s 43us/step - loss: 726.9829  
 Epoch 26/50  
 721/721 [=====] - 0s 43us/step - loss: 690.0994  
 Epoch 27/50  
 721/721 [=====] - 0s 43us/step - loss: 657.0403  
 Epoch 28/50  
 721/721 [=====] - 0s 43us/step - loss: 624.0914  
 Epoch 29/50  
 721/721 [=====] - 0s 43us/step - loss: 594.5225  
 Epoch 30/50  
 721/721 [=====] - 0s 43us/step - loss: 568.6179  
 Epoch 31/50  
 721/721 [=====] - 0s 43us/step - loss: 544.9287  
 Epoch 32/50  
 721/721 [=====] - 0s 43us/step - loss: 519.0314  
 Epoch 33/50  
 721/721 [=====] - 0s 43us/step - loss: 497.8845  
 Epoch 34/50  
 721/721 [=====] - 0s 43us/step - loss: 476.0987  
 Epoch 35/50  
 721/721 [=====] - 0s 43us/step - loss: 457.2310  
 Epoch 36/50  
 721/721 [=====] - 0s 43us/step - loss: 438.1759  
 Epoch 37/50  
 721/721 [=====] - 0s 43us/step - loss: 418.9428  
 Epoch 38/50  
 721/721 [=====] - 0s 43us/step - loss: 403.4690  
 Epoch 39/50  
 721/721 [=====] - 0s 43us/step - loss: 386.9547  
 Epoch 40/50  
 721/721 [=====] - 0s 43us/step - loss: 374.1202  
 Epoch 41/50  
 721/721 [=====] - 0s 43us/step - loss: 359.6009  
 Epoch 42/50

```

721/721 [=====] - 0s 43us/step - loss: 346.8347
Epoch 43/50
721/721 [=====] - 0s 43us/step - loss: 335.0864
Epoch 44/50
721/721 [=====] - 0s 65us/step - loss: 323.6820
Epoch 45/50
721/721 [=====] - 0s 43us/step - loss: 312.9421
Epoch 46/50
721/721 [=====] - 0s 43us/step - loss: 302.5799
Epoch 47/50
721/721 [=====] - 0s 65us/step - loss: 292.2265
Epoch 48/50
721/721 [=====] - 0s 43us/step - loss: 283.0904
Epoch 49/50
721/721 [=====] - 0s 43us/step - loss: 275.8957
Epoch 50/50
721/721 [=====] - 0s 43us/step - loss: 266.6440
Epoch 1/50
721/721 [=====] - 0s 607us/step - loss: 688.2800
Epoch 2/50
721/721 [=====] - 0s 43us/step - loss: 541.9189
Epoch 3/50
721/721 [=====] - 0s 43us/step - loss: 447.2795
Epoch 4/50
721/721 [=====] - 0s 65us/step - loss: 378.4979
Epoch 5/50
721/721 [=====] - 0s 43us/step - loss: 327.6647
Epoch 6/50
721/721 [=====] - 0s 43us/step - loss: 292.7696
Epoch 7/50
721/721 [=====] - 0s 43us/step - loss: 258.0180
Epoch 8/50
721/721 [=====] - 0s 65us/step - loss: 234.1994
Epoch 9/50
721/721 [=====] - 0s 22us/step - loss: 215.2870
Epoch 10/50
721/721 [=====] - 0s 43us/step - loss: 201.7467
Epoch 11/50
721/721 [=====] - 0s 43us/step - loss: 192.0003
Epoch 12/50
721/721 [=====] - 0s 43us/step - loss: 180.5097
Epoch 13/50
721/721 [=====] - 0s 65us/step - loss: 174.9526
Epoch 14/50
721/721 [=====] - 0s 43us/step - loss: 167.1626
Epoch 15/50
721/721 [=====] - 0s 43us/step - loss: 160.5157
Epoch 16/50

```



721/721 [=====] - 0s 43us/step - loss: 156.8935  
 Epoch 17/50  
 721/721 [=====] - 0s 43us/step - loss: 152.8291  
 Epoch 18/50  
 721/721 [=====] - 0s 43us/step - loss: 147.6085  
 Epoch 19/50  
 721/721 [=====] - 0s 43us/step - loss: 143.3706  
 Epoch 20/50  
 721/721 [=====] - 0s 43us/step - loss: 138.7009  
 Epoch 21/50  
 721/721 [=====] - 0s 43us/step - loss: 136.2305  
 Epoch 22/50  
 721/721 [=====] - 0s 43us/step - loss: 132.0940  
 Epoch 23/50  
 721/721 [=====] - 0s 43us/step - loss: 128.7382  
 Epoch 24/50  
 721/721 [=====] - 0s 22us/step - loss: 126.0299  
 Epoch 25/50  
 721/721 [=====] - 0s 43us/step - loss: 124.3631  
 Epoch 26/50  
 721/721 [=====] - 0s 43us/step - loss: 123.0287  
 Epoch 27/50  
 721/721 [=====] - 0s 43us/step - loss: 124.0535  
 Epoch 28/50  
 721/721 [=====] - 0s 43us/step - loss: 124.8506  
 Epoch 29/50  
 721/721 [=====] - 0s 43us/step - loss: 120.5551  
 Epoch 30/50  
 721/721 [=====] - 0s 22us/step - loss: 121.9392  
 Epoch 31/50  
 721/721 [=====] - 0s 65us/step - loss: 119.2106  
 Epoch 32/50  
 721/721 [=====] - 0s 22us/step - loss: 118.5752  
 Epoch 33/50  
 721/721 [=====] - 0s 65us/step - loss: 117.7961  
 Epoch 34/50  
 721/721 [=====] - 0s 43us/step - loss: 117.9515  
 Epoch 35/50  
 721/721 [=====] - 0s 52us/step - loss: 119.1818  
 Epoch 36/50  
 721/721 [=====] - 0s 43us/step - loss: 118.8549  
 Epoch 37/50  
 721/721 [=====] - 0s 43us/step - loss: 120.1615  
 Epoch 38/50  
 721/721 [=====] - 0s 43us/step - loss: 117.8532  
 Epoch 39/50  
 721/721 [=====] - 0s 43us/step - loss: 115.9184  
 Epoch 40/50

```

721/721 [=====] - 0s 65us/step - loss: 116.3908
Epoch 41/50
721/721 [=====] - 0s 43us/step - loss: 115.4361
Epoch 42/50
721/721 [=====] - 0s 43us/step - loss: 116.2607
Epoch 43/50
721/721 [=====] - 0s 43us/step - loss: 116.8685
Epoch 44/50
721/721 [=====] - 0s 43us/step - loss: 115.5437
Epoch 45/50
721/721 [=====] - 0s 43us/step - loss: 115.5467
Epoch 46/50
721/721 [=====] - 0s 43us/step - loss: 116.8882
Epoch 47/50
721/721 [=====] - 0s 65us/step - loss: 115.8656
Epoch 48/50
721/721 [=====] - 0s 43us/step - loss: 117.9702
Epoch 49/50
721/721 [=====] - 0s 43us/step - loss: 115.8896
Epoch 50/50
721/721 [=====] - 0s 43us/step - loss: 114.5290
Epoch 1/50
721/721 [=====] - 0s 628us/step - loss: 174650.6483
Epoch 2/50
721/721 [=====] - 0s 43us/step - loss: 101054.0684
Epoch 3/50
721/721 [=====] - 0s 43us/step - loss: 56785.8814
Epoch 4/50
721/721 [=====] - 0s 65us/step - loss: 30560.3413
Epoch 5/50
721/721 [=====] - 0s 22us/step - loss: 14667.6469
Epoch 6/50
721/721 [=====] - 0s 65us/step - loss: 6445.4056
Epoch 7/50
721/721 [=====] - 0s 43us/step - loss: 4088.5651
Epoch 8/50
721/721 [=====] - 0s 43us/step - loss: 3590.5486
Epoch 9/50
721/721 [=====] - 0s 43us/step - loss: 3249.4361
Epoch 10/50
721/721 [=====] - 0s 43us/step - loss: 2988.5901
Epoch 11/50
721/721 [=====] - 0s 43us/step - loss: 2763.5099
Epoch 12/50
721/721 [=====] - 0s 43us/step - loss: 2581.1542
Epoch 13/50
721/721 [=====] - 0s 43us/step - loss: 2403.7946
Epoch 14/50

```

721/721 [=====] - 0s 43us/step - loss: 2256.6693  
 Epoch 15/50  
 721/721 [=====] - 0s 43us/step - loss: 2125.0505  
 Epoch 16/50  
 721/721 [=====] - 0s 43us/step - loss: 2003.5172  
 Epoch 17/50  
 721/721 [=====] - 0s 43us/step - loss: 1894.6691  
 Epoch 18/50  
 721/721 [=====] - 0s 43us/step - loss: 1795.6725  
 Epoch 19/50  
 721/721 [=====] - 0s 43us/step - loss: 1701.4821  
 Epoch 20/50  
 721/721 [=====] - 0s 43us/step - loss: 1618.6200  
 Epoch 21/50  
 721/721 [=====] - 0s 43us/step - loss: 1538.8281  
 Epoch 22/50  
 721/721 [=====] - 0s 43us/step - loss: 1465.3410  
 Epoch 23/50  
 721/721 [=====] - 0s 65us/step - loss: 1397.7885  
 Epoch 24/50  
 721/721 [=====] - 0s 43us/step - loss: 1333.3528  
 Epoch 25/50  
 721/721 [=====] - 0s 43us/step - loss: 1276.7536  
 Epoch 26/50  
 721/721 [=====] - 0s 43us/step - loss: 1222.3014  
 Epoch 27/50  
 721/721 [=====] - 0s 65us/step - loss: 1167.5573  
 Epoch 28/50  
 721/721 [=====] - 0s 43us/step - loss: 1119.3404  
 Epoch 29/50  
 721/721 [=====] - 0s 43us/step - loss: 1071.6131  
 Epoch 30/50  
 721/721 [=====] - 0s 43us/step - loss: 1027.1609  
 Epoch 31/50  
 721/721 [=====] - 0s 65us/step - loss: 986.4454  
 Epoch 32/50  
 721/721 [=====] - 0s 43us/step - loss: 947.3405  
 Epoch 33/50  
 721/721 [=====] - 0s 43us/step - loss: 909.8261  
 Epoch 34/50  
 721/721 [=====] - 0s 43us/step - loss: 873.2980  
 Epoch 35/50  
 721/721 [=====] - 0s 65us/step - loss: 843.1133  
 Epoch 36/50  
 721/721 [=====] - 0s 43us/step - loss: 807.8591  
 Epoch 37/50  
 721/721 [=====] - 0s 43us/step - loss: 776.8528  
 Epoch 38/50

```

721/721 [=====] - 0s 43us/step - loss: 747.0036
Epoch 39/50
721/721 [=====] - 0s 43us/step - loss: 718.4838
Epoch 40/50
721/721 [=====] - 0s 43us/step - loss: 691.8996
Epoch 41/50
721/721 [=====] - 0s 65us/step - loss: 666.0215
Epoch 42/50
721/721 [=====] - 0s 43us/step - loss: 641.9595
Epoch 43/50
721/721 [=====] - 0s 43us/step - loss: 617.5278
Epoch 44/50
721/721 [=====] - 0s 43us/step - loss: 594.9081
Epoch 45/50
721/721 [=====] - 0s 43us/step - loss: 573.0043
Epoch 46/50
721/721 [=====] - 0s 43us/step - loss: 554.0546
Epoch 47/50
721/721 [=====] - 0s 43us/step - loss: 532.0884
Epoch 48/50
721/721 [=====] - 0s 43us/step - loss: 512.5367
Epoch 49/50
721/721 [=====] - 0s 43us/step - loss: 493.9191
Epoch 50/50
721/721 [=====] - 0s 65us/step - loss: 476.7646
Epoch 1/50
721/721 [=====] - 0s 672us/step - loss: 11669.2006
Epoch 2/50
721/721 [=====] - 0s 43us/step - loss: 8116.5746
Epoch 3/50
721/721 [=====] - 0s 43us/step - loss: 6836.0684
Epoch 4/50
721/721 [=====] - 0s 43us/step - loss: 5956.7845
Epoch 5/50
721/721 [=====] - 0s 43us/step - loss: 5206.4074
Epoch 6/50
721/721 [=====] - 0s 43us/step - loss: 4540.0571
Epoch 7/50
721/721 [=====] - 0s 43us/step - loss: 4004.1622
Epoch 8/50
721/721 [=====] - 0s 43us/step - loss: 3530.4273
Epoch 9/50
721/721 [=====] - 0s 43us/step - loss: 3133.3817
Epoch 10/50
721/721 [=====] - 0s 65us/step - loss: 2770.8140
Epoch 11/50
721/721 [=====] - 0s 44us/step - loss: 2483.5886
Epoch 12/50

```

721/721 [=====] - 0s 43us/step - loss: 2245.8013  
Epoch 13/50  
721/721 [=====] - 0s 43us/step - loss: 2016.7297  
Epoch 14/50  
721/721 [=====] - 0s 43us/step - loss: 1847.7544  
Epoch 15/50  
721/721 [=====] - 0s 65us/step - loss: 1672.7405  
Epoch 16/50  
721/721 [=====] - 0s 65us/step - loss: 1530.3908  
Epoch 17/50  
721/721 [=====] - 0s 43us/step - loss: 1411.2181  
Epoch 18/50  
721/721 [=====] - 0s 65us/step - loss: 1304.6030  
Epoch 19/50  
721/721 [=====] - 0s 43us/step - loss: 1209.6355  
Epoch 20/50  
721/721 [=====] - 0s 43us/step - loss: 1134.5952  
Epoch 21/50  
721/721 [=====] - 0s 43us/step - loss: 1067.0507  
Epoch 22/50  
721/721 [=====] - 0s 43us/step - loss: 1006.6330  
Epoch 23/50  
721/721 [=====] - 0s 65us/step - loss: 934.1728  
Epoch 24/50  
721/721 [=====] - 0s 43us/step - loss: 876.8954  
Epoch 25/50  
721/721 [=====] - 0s 43us/step - loss: 857.3047  
Epoch 26/50  
721/721 [=====] - 0s 43us/step - loss: 795.7676  
Epoch 27/50  
721/721 [=====] - 0s 43us/step - loss: 750.8770  
Epoch 28/50  
721/721 [=====] - 0s 43us/step - loss: 715.5606  
Epoch 29/50  
721/721 [=====] - 0s 65us/step - loss: 683.2815  
Epoch 30/50  
721/721 [=====] - 0s 43us/step - loss: 661.2091  
Epoch 31/50  
721/721 [=====] - 0s 43us/step - loss: 633.0549  
Epoch 32/50  
721/721 [=====] - 0s 43us/step - loss: 609.6908  
Epoch 33/50  
721/721 [=====] - 0s 43us/step - loss: 579.0905  
Epoch 34/50  
721/721 [=====] - 0s 65us/step - loss: 560.6320  
Epoch 35/50  
721/721 [=====] - 0s 22us/step - loss: 533.4785  
Epoch 36/50

```

721/721 [=====] - 0s 65us/step - loss: 516.0828
Epoch 37/50
721/721 [=====] - 0s 43us/step - loss: 494.9830
Epoch 38/50
721/721 [=====] - 0s 43us/step - loss: 478.8118
Epoch 39/50
721/721 [=====] - 0s 43us/step - loss: 464.5169
Epoch 40/50
721/721 [=====] - 0s 43us/step - loss: 447.6702
Epoch 41/50
721/721 [=====] - 0s 43us/step - loss: 433.4928
Epoch 42/50
721/721 [=====] - 0s 65us/step - loss: 424.8006
Epoch 43/50
721/721 [=====] - 0s 43us/step - loss: 408.4961
Epoch 44/50
721/721 [=====] - 0s 43us/step - loss: 398.8583
Epoch 45/50
721/721 [=====] - 0s 43us/step - loss: 381.4458
Epoch 46/50
721/721 [=====] - 0s 43us/step - loss: 369.6677
Epoch 47/50
721/721 [=====] - 0s 43us/step - loss: 359.1969
Epoch 48/50
721/721 [=====] - 0s 43us/step - loss: 348.5065
Epoch 49/50
721/721 [=====] - 0s 43us/step - loss: 342.3525
Epoch 50/50
721/721 [=====] - 0s 65us/step - loss: 330.0018
Epoch 1/50
721/721 [=====] - 1s 695us/step - loss: 727105.0195
Epoch 2/50
721/721 [=====] - 0s 43us/step - loss: 407287.0376
Epoch 3/50
721/721 [=====] - 0s 43us/step - loss: 211332.0592
Epoch 4/50
721/721 [=====] - 0s 43us/step - loss: 103608.0484
Epoch 5/50
721/721 [=====] - 0s 22us/step - loss: 49838.0751
Epoch 6/50
721/721 [=====] - 0s 43us/step - loss: 24498.8230
Epoch 7/50
721/721 [=====] - 0s 43us/step - loss: 13339.3703
Epoch 8/50
721/721 [=====] - 0s 43us/step - loss: 8574.5925
Epoch 9/50
721/721 [=====] - 0s 65us/step - loss: 6659.7470
Epoch 10/50

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721/721 [=====] - 0s 43us/step - loss: 5910.9347  
Epoch 11/50  
721/721 [=====] - 0s 43us/step - loss: 5549.2979  
Epoch 12/50  
721/721 [=====] - 0s 43us/step - loss: 5338.7848  
Epoch 13/50  
721/721 [=====] - 0s 65us/step - loss: 5162.5140  
Epoch 14/50  
721/721 [=====] - 0s 43us/step - loss: 4989.7188  
Epoch 15/50  
721/721 [=====] - 0s 43us/step - loss: 4820.2669  
Epoch 16/50  
721/721 [=====] - 0s 43us/step - loss: 4655.1740  
Epoch 17/50  
721/721 [=====] - 0s 43us/step - loss: 4491.8517  
Epoch 18/50  
721/721 [=====] - 0s 43us/step - loss: 4330.6306  
Epoch 19/50  
721/721 [=====] - 0s 43us/step - loss: 4174.4422  
Epoch 20/50  
721/721 [=====] - 0s 43us/step - loss: 4024.9028  
Epoch 21/50  
721/721 [=====] - 0s 43us/step - loss: 3875.8523  
Epoch 22/50  
721/721 [=====] - 0s 65us/step - loss: 3737.3667  
Epoch 23/50  
721/721 [=====] - 0s 43us/step - loss: 3596.2536  
Epoch 24/50  
721/721 [=====] - 0s 43us/step - loss: 3461.0556  
Epoch 25/50  
721/721 [=====] - 0s 65us/step - loss: 3333.7635  
Epoch 26/50  
721/721 [=====] - 0s 43us/step - loss: 3200.4777  
Epoch 27/50  
721/721 [=====] - 0s 43us/step - loss: 3076.9956  
Epoch 28/50  
721/721 [=====] - 0s 43us/step - loss: 2956.6688  
Epoch 29/50  
721/721 [=====] - 0s 43us/step - loss: 2844.2527  
Epoch 30/50  
721/721 [=====] - 0s 65us/step - loss: 2728.8100  
Epoch 31/50  
721/721 [=====] - 0s 43us/step - loss: 2621.3074  
Epoch 32/50  
721/721 [=====] - 0s 43us/step - loss: 2517.7417  
Epoch 33/50  
721/721 [=====] - 0s 43us/step - loss: 2419.5499  
Epoch 34/50

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721/721 [=====] - 0s 65us/step - loss: 2321.5188
Epoch 35/50
721/721 [=====] - 0s 43us/step - loss: 2229.5397
Epoch 36/50
721/721 [=====] - 0s 43us/step - loss: 2139.9846
Epoch 37/50
721/721 [=====] - 0s 43us/step - loss: 2056.9827
Epoch 38/50
721/721 [=====] - 0s 43us/step - loss: 1974.6585
Epoch 39/50
721/721 [=====] - 0s 65us/step - loss: 1897.4597
Epoch 40/50
721/721 [=====] - 0s 43us/step - loss: 1823.2874
Epoch 41/50
721/721 [=====] - 0s 43us/step - loss: 1750.0378
Epoch 42/50
721/721 [=====] - 0s 43us/step - loss: 1680.7222
Epoch 43/50
721/721 [=====] - 0s 65us/step - loss: 1613.5808
Epoch 44/50
721/721 [=====] - 0s 43us/step - loss: 1551.5590
Epoch 45/50
721/721 [=====] - 0s 43us/step - loss: 1489.2422
Epoch 46/50
721/721 [=====] - 0s 43us/step - loss: 1429.1132
Epoch 47/50
721/721 [=====] - 0s 65us/step - loss: 1372.8680
Epoch 48/50
721/721 [=====] - 0s 43us/step - loss: 1318.3839
Epoch 49/50
721/721 [=====] - 0s 43us/step - loss: 1263.5081
Epoch 50/50
721/721 [=====] - 0s 43us/step - loss: 1214.4380
Epoch 1/50
721/721 [=====] - 1s 737us/step - loss: 47942.2243
Epoch 2/50
721/721 [=====] - 0s 43us/step - loss: 12519.2073
Epoch 3/50
721/721 [=====] - 0s 43us/step - loss: 2697.4494
Epoch 4/50
721/721 [=====] - 0s 43us/step - loss: 1627.7291
Epoch 5/50
721/721 [=====] - 0s 65us/step - loss: 1585.1394
Epoch 6/50
721/721 [=====] - 0s 43us/step - loss: 1529.7738
Epoch 7/50
721/721 [=====] - 0s 43us/step - loss: 1483.3327
Epoch 8/50

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721/721 [=====] - 0s 43us/step - loss: 1431.6128
Epoch 9/50
721/721 [=====] - 0s 43us/step - loss: 1380.0367
Epoch 10/50
721/721 [=====] - 0s 43us/step - loss: 1329.2442
Epoch 11/50
721/721 [=====] - 0s 65us/step - loss: 1277.5293
Epoch 12/50
721/721 [=====] - 0s 43us/step - loss: 1225.5681
Epoch 13/50
721/721 [=====] - 0s 43us/step - loss: 1174.9999
Epoch 14/50
721/721 [=====] - 0s 65us/step - loss: 1123.2360
Epoch 15/50
721/721 [=====] - 0s 22us/step - loss: 1073.2823
Epoch 16/50
721/721 [=====] - 0s 43us/step - loss: 1024.9460
Epoch 17/50
721/721 [=====] - 0s 43us/step - loss: 973.6141
Epoch 18/50
721/721 [=====] - 0s 43us/step - loss: 925.4503
Epoch 19/50
721/721 [=====] - 0s 65us/step - loss: 877.3028
Epoch 20/50
721/721 [=====] - 0s 43us/step - loss: 832.6131
Epoch 21/50
721/721 [=====] - 0s 43us/step - loss: 790.6380
Epoch 22/50
721/721 [=====] - 0s 43us/step - loss: 747.5083
Epoch 23/50
721/721 [=====] - 0s 43us/step - loss: 707.9845
Epoch 24/50
721/721 [=====] - 0s 65us/step - loss: 672.0737
Epoch 25/50
721/721 [=====] - 0s 43us/step - loss: 638.4517
Epoch 26/50
721/721 [=====] - 0s 43us/step - loss: 604.8815
Epoch 27/50
721/721 [=====] - 0s 43us/step - loss: 572.1971
Epoch 28/50
721/721 [=====] - 0s 43us/step - loss: 543.1534
Epoch 29/50
721/721 [=====] - 0s 43us/step - loss: 514.6957
Epoch 30/50
721/721 [=====] - 0s 65us/step - loss: 490.7139
Epoch 31/50
721/721 [=====] - 0s 43us/step - loss: 464.3476
Epoch 32/50

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721/721 [=====] - 0s 43us/step - loss: 440.0719
Epoch 33/50
721/721 [=====] - 0s 43us/step - loss: 418.5384
Epoch 34/50
721/721 [=====] - 0s 43us/step - loss: 399.0722
Epoch 35/50
721/721 [=====] - 0s 65us/step - loss: 379.8123
Epoch 36/50
721/721 [=====] - 0s 43us/step - loss: 361.8025
Epoch 37/50
721/721 [=====] - 0s 43us/step - loss: 343.1142
Epoch 38/50
721/721 [=====] - 0s 43us/step - loss: 329.3706
Epoch 39/50
721/721 [=====] - 0s 43us/step - loss: 312.8808
Epoch 40/50
721/721 [=====] - 0s 43us/step - loss: 299.6430
Epoch 41/50
721/721 [=====] - 0s 43us/step - loss: 285.8679
Epoch 42/50
721/721 [=====] - 0s 65us/step - loss: 272.6257
Epoch 43/50
721/721 [=====] - 0s 43us/step - loss: 262.4114
Epoch 44/50
721/721 [=====] - 0s 43us/step - loss: 250.4613
Epoch 45/50
721/721 [=====] - 0s 43us/step - loss: 240.8192
Epoch 46/50
721/721 [=====] - 0s 43us/step - loss: 230.4526
Epoch 47/50
721/721 [=====] - 0s 65us/step - loss: 222.5578
Epoch 48/50
721/721 [=====] - 0s 43us/step - loss: 213.8428
Epoch 49/50
721/721 [=====] - 0s 43us/step - loss: 207.8526
Epoch 50/50
721/721 [=====] - 0s 22us/step - loss: 199.8795
Epoch 1/50
721/721 [=====] - 1s 759us/step - loss: 39924.3288
Epoch 2/50
721/721 [=====] - 0s 22us/step - loss: 21909.8883
Epoch 3/50
721/721 [=====] - 0s 43us/step - loss: 7928.5497
Epoch 4/50
721/721 [=====] - 0s 43us/step - loss: 2542.1401
Epoch 5/50
721/721 [=====] - 0s 65us/step - loss: 2205.4554
Epoch 6/50

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721/721 [=====] - 0s 43us/step - loss: 2002.7007
Epoch 7/50
721/721 [=====] - 0s 43us/step - loss: 1852.8458
Epoch 8/50
721/721 [=====] - 0s 43us/step - loss: 1717.3533
Epoch 9/50
721/721 [=====] - 0s 65us/step - loss: 1603.1223
Epoch 10/50
721/721 [=====] - 0s 43us/step - loss: 1496.7411
Epoch 11/50
721/721 [=====] - 0s 43us/step - loss: 1401.6492
Epoch 12/50
721/721 [=====] - 0s 43us/step - loss: 1317.5811
Epoch 13/50
721/721 [=====] - 0s 43us/step - loss: 1237.4896
Epoch 14/50
721/721 [=====] - 0s 43us/step - loss: 1166.4785
Epoch 15/50
721/721 [=====] - 0s 43us/step - loss: 1101.2884
Epoch 16/50
721/721 [=====] - 0s 65us/step - loss: 1046.2011
Epoch 17/50
721/721 [=====] - 0s 43us/step - loss: 994.9392
Epoch 18/50
721/721 [=====] - 0s 43us/step - loss: 947.4839
Epoch 19/50
721/721 [=====] - 0s 65us/step - loss: 900.5949
Epoch 20/50
721/721 [=====] - 0s 43us/step - loss: 862.6660
Epoch 21/50
721/721 [=====] - 0s 43us/step - loss: 822.8049
Epoch 22/50
721/721 [=====] - 0s 43us/step - loss: 789.2817
Epoch 23/50
721/721 [=====] - 0s 65us/step - loss: 761.3294
Epoch 24/50
721/721 [=====] - 0s 43us/step - loss: 729.5584
Epoch 25/50
721/721 [=====] - 0s 43us/step - loss: 702.3341
Epoch 26/50
721/721 [=====] - 0s 43us/step - loss: 675.5939
Epoch 27/50
721/721 [=====] - 0s 65us/step - loss: 651.0738
Epoch 28/50
721/721 [=====] - 0s 43us/step - loss: 631.1120
Epoch 29/50
721/721 [=====] - 0s 43us/step - loss: 608.3257
Epoch 30/50

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```

721/721 [=====] - 0s 65us/step - loss: 585.7270
Epoch 31/50
721/721 [=====] - 0s 43us/step - loss: 567.2252
Epoch 32/50
721/721 [=====] - 0s 43us/step - loss: 548.5530
Epoch 33/50
721/721 [=====] - 0s 22us/step - loss: 534.0966
Epoch 34/50
721/721 [=====] - 0s 65us/step - loss: 515.4180
Epoch 35/50
721/721 [=====] - 0s 43us/step - loss: 499.2088
Epoch 36/50
721/721 [=====] - 0s 43us/step - loss: 483.4223
Epoch 37/50
721/721 [=====] - 0s 65us/step - loss: 467.9304
Epoch 38/50
721/721 [=====] - 0s 43us/step - loss: 454.2606
Epoch 39/50
721/721 [=====] - 0s 43us/step - loss: 440.8651
Epoch 40/50
721/721 [=====] - 0s 43us/step - loss: 427.3219
Epoch 41/50
721/721 [=====] - 0s 43us/step - loss: 416.5074
Epoch 42/50
721/721 [=====] - 0s 43us/step - loss: 404.5659
Epoch 43/50
721/721 [=====] - 0s 43us/step - loss: 392.1695
Epoch 44/50
721/721 [=====] - 0s 65us/step - loss: 381.8447
Epoch 45/50
721/721 [=====] - 0s 43us/step - loss: 372.1280
Epoch 46/50
721/721 [=====] - 0s 43us/step - loss: 361.6236
Epoch 47/50
721/721 [=====] - 0s 43us/step - loss: 351.7679
Epoch 48/50
721/721 [=====] - 0s 65us/step - loss: 343.2026
Epoch 49/50
721/721 [=====] - 0s 43us/step - loss: 334.4098
Epoch 50/50
721/721 [=====] - 0s 43us/step - loss: 326.8550
Epoch 1/50
721/721 [=====] - 1s 802us/step - loss: 6676.7169
Epoch 2/50
721/721 [=====] - 0s 43us/step - loss: 5256.9858
Epoch 3/50
721/721 [=====] - 0s 65us/step - loss: 4035.9443
Epoch 4/50

```

721/721 [=====] - 0s 43us/step - loss: 3081.3457  
 Epoch 5/50  
 721/721 [=====] - 0s 43us/step - loss: 2328.5716  
 Epoch 6/50  
 721/721 [=====] - 0s 65us/step - loss: 1873.5534  
 Epoch 7/50  
 721/721 [=====] - 0s 43us/step - loss: 1584.1856  
 Epoch 8/50  
 721/721 [=====] - 0s 43us/step - loss: 1376.4279  
 Epoch 9/50  
 721/721 [=====] - 0s 65us/step - loss: 1231.0067  
 Epoch 10/50  
 721/721 [=====] - 0s 43us/step - loss: 1088.7574  
 Epoch 11/50  
 721/721 [=====] - 0s 43us/step - loss: 984.9333  
 Epoch 12/50  
 721/721 [=====] - 0s 44us/step - loss: 869.8733  
 Epoch 13/50  
 721/721 [=====] - 0s 43us/step - loss: 784.0591  
 Epoch 14/50  
 721/721 [=====] - 0s 43us/step - loss: 709.6968  
 Epoch 15/50  
 721/721 [=====] - 0s 43us/step - loss: 643.0799  
 Epoch 16/50  
 721/721 [=====] - 0s 65us/step - loss: 584.2760  
 Epoch 17/50  
 721/721 [=====] - 0s 43us/step - loss: 534.5398  
 Epoch 18/50  
 721/721 [=====] - 0s 43us/step - loss: 490.0615  
 Epoch 19/50  
 721/721 [=====] - 0s 65us/step - loss: 453.0653  
 Epoch 20/50  
 721/721 [=====] - 0s 43us/step - loss: 417.1549  
 Epoch 21/50  
 721/721 [=====] - 0s 43us/step - loss: 390.9384  
 Epoch 22/50  
 721/721 [=====] - 0s 43us/step - loss: 363.3288  
 Epoch 23/50  
 721/721 [=====] - 0s 43us/step - loss: 335.9529  
 Epoch 24/50  
 721/721 [=====] - 0s 43us/step - loss: 313.6164  
 Epoch 25/50  
 721/721 [=====] - 0s 43us/step - loss: 295.5716  
 Epoch 26/50  
 721/721 [=====] - 0s 22us/step - loss: 280.1440  
 Epoch 27/50  
 721/721 [=====] - 0s 43us/step - loss: 261.3615  
 Epoch 28/50

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721/721 [=====] - 0s 43us/step - loss: 248.6620
Epoch 29/50
721/721 [=====] - 0s 43us/step - loss: 237.1534
Epoch 30/50
721/721 [=====] - 0s 43us/step - loss: 223.8936
Epoch 31/50
721/721 [=====] - 0s 43us/step - loss: 214.2661
Epoch 32/50
721/721 [=====] - 0s 43us/step - loss: 206.8082
Epoch 33/50
721/721 [=====] - 0s 22us/step - loss: 198.7920
Epoch 34/50
721/721 [=====] - 0s 43us/step - loss: 189.3991
Epoch 35/50
721/721 [=====] - 0s 43us/step - loss: 184.6277
Epoch 36/50
721/721 [=====] - 0s 43us/step - loss: 177.9170
Epoch 37/50
721/721 [=====] - 0s 43us/step - loss: 171.9832
Epoch 38/50
721/721 [=====] - 0s 43us/step - loss: 166.9612
Epoch 39/50
721/721 [=====] - 0s 43us/step - loss: 163.0746
Epoch 40/50
721/721 [=====] - 0s 43us/step - loss: 161.9551
Epoch 41/50
721/721 [=====] - 0s 43us/step - loss: 162.0237
Epoch 42/50
721/721 [=====] - 0s 43us/step - loss: 150.8422
Epoch 43/50
721/721 [=====] - 0s 65us/step - loss: 148.7295
Epoch 44/50
721/721 [=====] - 0s 65us/step - loss: 144.5603
Epoch 45/50
721/721 [=====] - 0s 65us/step - loss: 143.6356
Epoch 46/50
721/721 [=====] - 0s 43us/step - loss: 140.9427
Epoch 47/50
721/721 [=====] - 0s 65us/step - loss: 138.2404
Epoch 48/50
721/721 [=====] - 0s 65us/step - loss: 136.5140
Epoch 49/50
721/721 [=====] - 0s 43us/step - loss: 134.0496
Epoch 50/50
721/721 [=====] - 0s 43us/step - loss: 136.0319
Epoch 1/50
721/721 [=====] - 1s 1ms/step - loss: 5615.8240
Epoch 2/50

```

721/721 [=====] - 0s 43us/step - loss: 2069.7641  
 Epoch 3/50  
 721/721 [=====] - 0s 65us/step - loss: 1576.1389  
 Epoch 4/50  
 721/721 [=====] - 0s 43us/step - loss: 1284.1993  
 Epoch 5/50  
 721/721 [=====] - 0s 65us/step - loss: 1054.7118  
 Epoch 6/50  
 721/721 [=====] - 0s 65us/step - loss: 862.5675  
 Epoch 7/50  
 721/721 [=====] - 0s 65us/step - loss: 700.9821  
 Epoch 8/50  
 721/721 [=====] - 0s 65us/step - loss: 583.2616  
 Epoch 9/50  
 721/721 [=====] - 0s 65us/step - loss: 478.8331  
 Epoch 10/50  
 721/721 [=====] - 0s 65us/step - loss: 403.3070  
 Epoch 11/50  
 721/721 [=====] - 0s 43us/step - loss: 347.2377  
 Epoch 12/50  
 721/721 [=====] - 0s 65us/step - loss: 297.4792  
 Epoch 13/50  
 721/721 [=====] - 0s 43us/step - loss: 265.1791  
 Epoch 14/50  
 721/721 [=====] - 0s 65us/step - loss: 235.9102  
 Epoch 15/50  
 721/721 [=====] - 0s 65us/step - loss: 216.5954  
 Epoch 16/50  
 721/721 [=====] - 0s 65us/step - loss: 201.8570  
 Epoch 17/50  
 721/721 [=====] - 0s 65us/step - loss: 190.9891  
 Epoch 18/50  
 721/721 [=====] - 0s 43us/step - loss: 182.3218  
 Epoch 19/50  
 721/721 [=====] - 0s 43us/step - loss: 174.9479  
 Epoch 20/50  
 721/721 [=====] - 0s 65us/step - loss: 170.1616  
 Epoch 21/50  
 721/721 [=====] - 0s 65us/step - loss: 164.8048  
 Epoch 22/50  
 721/721 [=====] - 0s 43us/step - loss: 162.6780  
 Epoch 23/50  
 721/721 [=====] - 0s 65us/step - loss: 158.7243  
 Epoch 24/50  
 721/721 [=====] - 0s 43us/step - loss: 151.4591  
 Epoch 25/50  
 721/721 [=====] - 0s 43us/step - loss: 153.4211  
 Epoch 26/50

721/721 [=====] - 0s 65us/step - loss: 149.0284  
 Epoch 27/50  
 721/721 [=====] - 0s 43us/step - loss: 147.7799  
 Epoch 28/50  
 721/721 [=====] - 0s 43us/step - loss: 144.1554  
 Epoch 29/50  
 721/721 [=====] - 0s 43us/step - loss: 142.5422  
 Epoch 30/50  
 721/721 [=====] - 0s 65us/step - loss: 140.8358  
 Epoch 31/50  
 721/721 [=====] - 0s 43us/step - loss: 138.2322  
 Epoch 32/50  
 721/721 [=====] - 0s 65us/step - loss: 139.5607  
 Epoch 33/50  
 721/721 [=====] - 0s 50us/step - loss: 135.5818  
 Epoch 34/50  
 721/721 [=====] - 0s 65us/step - loss: 136.9123  
 Epoch 35/50  
 721/721 [=====] - 0s 43us/step - loss: 135.4445  
 Epoch 36/50  
 721/721 [=====] - 0s 65us/step - loss: 133.4220  
 Epoch 37/50  
 721/721 [=====] - 0s 43us/step - loss: 132.7489  
 Epoch 38/50  
 721/721 [=====] - 0s 43us/step - loss: 132.0120  
 Epoch 39/50  
 721/721 [=====] - 0s 43us/step - loss: 131.0760  
 Epoch 40/50  
 721/721 [=====] - 0s 65us/step - loss: 131.5530  
 Epoch 41/50  
 721/721 [=====] - 0s 43us/step - loss: 129.8845  
 Epoch 42/50  
 721/721 [=====] - 0s 43us/step - loss: 128.6552  
 Epoch 43/50  
 721/721 [=====] - 0s 43us/step - loss: 130.9468  
 Epoch 44/50  
 721/721 [=====] - 0s 43us/step - loss: 131.0995  
 Epoch 45/50  
 721/721 [=====] - 0s 43us/step - loss: 126.8163  
 Epoch 46/50  
 721/721 [=====] - 0s 65us/step - loss: 126.1578  
 Epoch 47/50  
 721/721 [=====] - 0s 43us/step - loss: 129.8917  
 Epoch 48/50  
 721/721 [=====] - 0s 65us/step - loss: 126.4020  
 Epoch 49/50  
 721/721 [=====] - 0s 43us/step - loss: 126.7958  
 Epoch 50/50



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721/721 [=====] - 0s 65us/step - loss: 124.2575
Epoch 1/50
721/721 [=====] - 1s 1ms/step - loss: 9841.5931
Epoch 2/50
721/721 [=====] - 0s 65us/step - loss: 4375.7319
Epoch 3/50
721/721 [=====] - 0s 87us/step - loss: 2215.0974
Epoch 4/50
721/721 [=====] - 0s 65us/step - loss: 1144.1342
Epoch 5/50
721/721 [=====] - 0s 65us/step - loss: 765.7940
Epoch 6/50
721/721 [=====] - 0s 65us/step - loss: 643.1885
Epoch 7/50
721/721 [=====] - 0s 65us/step - loss: 561.3646
Epoch 8/50
721/721 [=====] - 0s 87us/step - loss: 491.3789
Epoch 9/50
721/721 [=====] - 0s 65us/step - loss: 439.1315
Epoch 10/50
721/721 [=====] - 0s 65us/step - loss: 397.4189
Epoch 11/50
721/721 [=====] - 0s 43us/step - loss: 362.0525
Epoch 12/50
721/721 [=====] - 0s 43us/step - loss: 334.8052
Epoch 13/50
721/721 [=====] - 0s 43us/step - loss: 310.2776
Epoch 14/50
721/721 [=====] - 0s 65us/step - loss: 292.2059
Epoch 15/50
721/721 [=====] - 0s 87us/step - loss: 274.1278
Epoch 16/50
721/721 [=====] - 0s 65us/step - loss: 259.8480
Epoch 17/50
721/721 [=====] - 0s 65us/step - loss: 248.0950
Epoch 18/50
721/721 [=====] - 0s 43us/step - loss: 238.4307
Epoch 19/50
721/721 [=====] - 0s 65us/step - loss: 229.5405
Epoch 20/50
721/721 [=====] - 0s 87us/step - loss: 222.5352
Epoch 21/50
721/721 [=====] - 0s 65us/step - loss: 215.5267
Epoch 22/50
721/721 [=====] - 0s 44us/step - loss: 209.8080
Epoch 23/50
721/721 [=====] - 0s 65us/step - loss: 204.8026
Epoch 24/50

```

721/721 [=====] - 0s 87us/step - loss: 198.8584  
 Epoch 25/50  
 721/721 [=====] - 0s 65us/step - loss: 194.5444  
 Epoch 26/50  
 721/721 [=====] - 0s 65us/step - loss: 190.6040  
 Epoch 27/50  
 721/721 [=====] - 0s 65us/step - loss: 187.0417  
 Epoch 28/50  
 721/721 [=====] - 0s 65us/step - loss: 183.5090  
 Epoch 29/50  
 721/721 [=====] - 0s 87us/step - loss: 177.8474  
 Epoch 30/50  
 721/721 [=====] - 0s 65us/step - loss: 174.1580  
 Epoch 31/50  
 721/721 [=====] - 0s 65us/step - loss: 172.3036  
 Epoch 32/50  
 721/721 [=====] - 0s 65us/step - loss: 168.8789  
 Epoch 33/50  
 721/721 [=====] - 0s 43us/step - loss: 165.9032  
 Epoch 34/50  
 721/721 [=====] - 0s 87us/step - loss: 164.0576  
 Epoch 35/50  
 721/721 [=====] - 0s 65us/step - loss: 161.7163  
 Epoch 36/50  
 721/721 [=====] - 0s 87us/step - loss: 159.8573  
 Epoch 37/50  
 721/721 [=====] - 0s 65us/step - loss: 158.2115  
 Epoch 38/50  
 721/721 [=====] - 0s 43us/step - loss: 156.8291  
 Epoch 39/50  
 721/721 [=====] - 0s 65us/step - loss: 154.3663  
 Epoch 40/50  
 721/721 [=====] - 0s 65us/step - loss: 152.3694  
 Epoch 41/50  
 721/721 [=====] - 0s 65us/step - loss: 151.1562  
 Epoch 42/50  
 721/721 [=====] - 0s 87us/step - loss: 149.4098  
 Epoch 43/50  
 721/721 [=====] - 0s 65us/step - loss: 149.2969  
 Epoch 44/50  
 721/721 [=====] - 0s 87us/step - loss: 147.7175  
 Epoch 45/50  
 721/721 [=====] - 0s 66us/step - loss: 145.6843  
 Epoch 46/50  
 721/721 [=====] - 0s 43us/step - loss: 145.5518  
 Epoch 47/50  
 721/721 [=====] - 0s 65us/step - loss: 143.0982  
 Epoch 48/50

721/721 [=====] - 0s 43us/step - loss: 141.8471  
 Epoch 49/50  
 721/721 [=====] - 0s 87us/step - loss: 141.5440  
 Epoch 50/50  
 721/721 [=====] - 0s 65us/step - loss: 142.2090  
 Epoch 1/50  
 721/721 [=====] - 1s 1ms/step - loss: 72117.1821  
 Epoch 2/50  
 721/721 [=====] - 0s 65us/step - loss: 19153.1577  
 Epoch 3/50  
 721/721 [=====] - 0s 65us/step - loss: 3465.0906  
 Epoch 4/50  
 721/721 [=====] - 0s 43us/step - loss: 1347.5212  
 Epoch 5/50  
 721/721 [=====] - 0s 65us/step - loss: 1235.5768  
 Epoch 6/50  
 721/721 [=====] - 0s 65us/step - loss: 1171.9715  
 Epoch 7/50  
 721/721 [=====] - 0s 87us/step - loss: 1106.1468  
 Epoch 8/50  
 721/721 [=====] - 0s 65us/step - loss: 1051.8836  
 Epoch 9/50  
 721/721 [=====] - 0s 65us/step - loss: 995.9672  
 Epoch 10/50  
 721/721 [=====] - 0s 43us/step - loss: 945.0086  
 Epoch 11/50  
 721/721 [=====] - 0s 43us/step - loss: 896.6218  
 Epoch 12/50  
 721/721 [=====] - 0s 87us/step - loss: 849.0455  
 Epoch 13/50  
 721/721 [=====] - 0s 65us/step - loss: 804.6973  
 Epoch 14/50  
 721/721 [=====] - 0s 87us/step - loss: 763.5882  
 Epoch 15/50  
 721/721 [=====] - 0s 43us/step - loss: 726.7207  
 Epoch 16/50  
 721/721 [=====] - 0s 65us/step - loss: 688.3592  
 Epoch 17/50  
 721/721 [=====] - 0s 65us/step - loss: 654.6896  
 Epoch 18/50  
 721/721 [=====] - 0s 87us/step - loss: 624.2962  
 Epoch 19/50  
 721/721 [=====] - 0s 43us/step - loss: 594.7708  
 Epoch 20/50  
 721/721 [=====] - 0s 65us/step - loss: 567.3259  
 Epoch 21/50  
 721/721 [=====] - 0s 65us/step - loss: 543.2830  
 Epoch 22/50

721/721 [=====] - 0s 22us/step - loss: 519.9999  
 Epoch 23/50  
 721/721 [=====] - 0s 43us/step - loss: 498.7740  
 Epoch 24/50  
 721/721 [=====] - 0s 65us/step - loss: 478.4880  
 Epoch 25/50  
 721/721 [=====] - 0s 43us/step - loss: 460.8732  
 Epoch 26/50  
 721/721 [=====] - 0s 65us/step - loss: 443.0741  
 Epoch 27/50  
 721/721 [=====] - 0s 43us/step - loss: 426.9911  
 Epoch 28/50  
 721/721 [=====] - 0s 66us/step - loss: 413.1815  
 Epoch 29/50  
 721/721 [=====] - 0s 65us/step - loss: 397.7599  
 Epoch 30/50  
 721/721 [=====] - 0s 43us/step - loss: 385.9223  
 Epoch 31/50  
 721/721 [=====] - 0s 65us/step - loss: 370.8401  
 Epoch 32/50  
 721/721 [=====] - 0s 65us/step - loss: 359.5536  
 Epoch 33/50  
 721/721 [=====] - 0s 43us/step - loss: 347.6869  
 Epoch 34/50  
 721/721 [=====] - 0s 43us/step - loss: 336.8828  
 Epoch 35/50  
 721/721 [=====] - 0s 65us/step - loss: 326.0594  
 Epoch 36/50  
 721/721 [=====] - 0s 43us/step - loss: 316.5412  
 Epoch 37/50  
 721/721 [=====] - 0s 65us/step - loss: 306.6876  
 Epoch 38/50  
 721/721 [=====] - 0s 65us/step - loss: 298.8744  
 Epoch 39/50  
 721/721 [=====] - 0s 65us/step - loss: 292.2046  
 Epoch 40/50  
 721/721 [=====] - 0s 65us/step - loss: 282.5932  
 Epoch 41/50  
 721/721 [=====] - 0s 43us/step - loss: 274.1298  
 Epoch 42/50  
 721/721 [=====] - 0s 65us/step - loss: 266.7758  
 Epoch 43/50  
 721/721 [=====] - 0s 43us/step - loss: 260.9070  
 Epoch 44/50  
 721/721 [=====] - 0s 65us/step - loss: 254.5989  
 Epoch 45/50  
 721/721 [=====] - 0s 43us/step - loss: 247.9010  
 Epoch 46/50

```

721/721 [=====] - 0s 65us/step - loss: 241.6854
Epoch 47/50
721/721 [=====] - 0s 65us/step - loss: 236.6956
Epoch 48/50
721/721 [=====] - 0s 65us/step - loss: 230.6044
Epoch 49/50
721/721 [=====] - 0s 43us/step - loss: 225.2066
Epoch 50/50
721/721 [=====] - 0s 65us/step - loss: 219.9317
Epoch 1/50
721/721 [=====] - 1s 997us/step - loss: 227853.9573
Epoch 2/50
721/721 [=====] - 0s 65us/step - loss: 123018.3484
Epoch 3/50
721/721 [=====] - 0s 43us/step - loss: 59275.3714
Epoch 4/50
721/721 [=====] - 0s 43us/step - loss: 24175.8282
Epoch 5/50
721/721 [=====] - 0s 65us/step - loss: 8974.9592
Epoch 6/50
721/721 [=====] - 0s 43us/step - loss: 6229.2741
Epoch 7/50
721/721 [=====] - 0s 65us/step - loss: 5600.7720
Epoch 8/50
721/721 [=====] - 0s 43us/step - loss: 5160.3024
Epoch 9/50
721/721 [=====] - 0s 65us/step - loss: 4792.3138
Epoch 10/50
721/721 [=====] - 0s 43us/step - loss: 4448.3020
Epoch 11/50
721/721 [=====] - 0s 65us/step - loss: 4160.1157
Epoch 12/50
721/721 [=====] - 0s 43us/step - loss: 3892.0820
Epoch 13/50
721/721 [=====] - 0s 65us/step - loss: 3656.3428
Epoch 14/50
721/721 [=====] - 0s 43us/step - loss: 3431.6878
Epoch 15/50
721/721 [=====] - 0s 65us/step - loss: 3232.6231
Epoch 16/50
721/721 [=====] - 0s 43us/step - loss: 3046.0773
Epoch 17/50
721/721 [=====] - 0s 65us/step - loss: 2866.7158
Epoch 18/50
721/721 [=====] - 0s 43us/step - loss: 2702.9298
Epoch 19/50
721/721 [=====] - 0s 65us/step - loss: 2541.4127
Epoch 20/50

```

721/721 [=====] - 0s 43us/step - loss: 2392.9969  
 Epoch 21/50  
 721/721 [=====] - 0s 65us/step - loss: 2254.1674  
 Epoch 22/50  
 721/721 [=====] - 0s 43us/step - loss: 2116.6155  
 Epoch 23/50  
 721/721 [=====] - 0s 43us/step - loss: 1990.1372  
 Epoch 24/50  
 721/721 [=====] - 0s 43us/step - loss: 1870.0988  
 Epoch 25/50  
 721/721 [=====] - 0s 43us/step - loss: 1761.9919  
 Epoch 26/50  
 721/721 [=====] - 0s 65us/step - loss: 1644.6606  
 Epoch 27/50  
 721/721 [=====] - 0s 43us/step - loss: 1538.6945  
 Epoch 28/50  
 721/721 [=====] - 0s 65us/step - loss: 1441.1063  
 Epoch 29/50  
 721/721 [=====] - 0s 43us/step - loss: 1349.7849  
 Epoch 30/50  
 721/721 [=====] - 0s 43us/step - loss: 1260.1126  
 Epoch 31/50  
 721/721 [=====] - 0s 43us/step - loss: 1180.0796  
 Epoch 32/50  
 721/721 [=====] - 0s 65us/step - loss: 1103.5432  
 Epoch 33/50  
 721/721 [=====] - 0s 43us/step - loss: 1032.2579  
 Epoch 34/50  
 721/721 [=====] - 0s 43us/step - loss: 964.3910  
 Epoch 35/50  
 721/721 [=====] - 0s 65us/step - loss: 899.4620  
 Epoch 36/50  
 721/721 [=====] - 0s 43us/step - loss: 842.7985  
 Epoch 37/50  
 721/721 [=====] - 0s 43us/step - loss: 795.8579  
 Epoch 38/50  
 721/721 [=====] - 0s 43us/step - loss: 747.6095  
 Epoch 39/50  
 721/721 [=====] - 0s 65us/step - loss: 695.5549  
 Epoch 40/50  
 721/721 [=====] - 0s 43us/step - loss: 653.9679  
 Epoch 41/50  
 721/721 [=====] - 0s 65us/step - loss: 615.5684  
 Epoch 42/50  
 721/721 [=====] - 0s 43us/step - loss: 581.8379  
 Epoch 43/50  
 721/721 [=====] - 0s 43us/step - loss: 549.0639  
 Epoch 44/50

```

721/721 [=====] - 0s 43us/step - loss: 521.6524
Epoch 45/50
721/721 [=====] - 0s 51us/step - loss: 492.7667
Epoch 46/50
721/721 [=====] - 0s 65us/step - loss: 468.7694
Epoch 47/50
721/721 [=====] - 0s 43us/step - loss: 445.9702
Epoch 48/50
721/721 [=====] - 0s 65us/step - loss: 424.0867
Epoch 49/50
721/721 [=====] - 0s 43us/step - loss: 406.7281
Epoch 50/50
721/721 [=====] - 0s 65us/step - loss: 388.4491
Epoch 1/50
721/721 [=====] - 1s 1ms/step - loss: 340015.1553
Epoch 2/50
721/721 [=====] - 0s 65us/step - loss: 145344.5742
Epoch 3/50
721/721 [=====] - 0s 65us/step - loss: 41634.8708
Epoch 4/50
721/721 [=====] - 0s 43us/step - loss: 9685.4202
Epoch 5/50
721/721 [=====] - 0s 65us/step - loss: 6251.1684
Epoch 6/50
721/721 [=====] - 0s 65us/step - loss: 5867.7978
Epoch 7/50
721/721 [=====] - 0s 65us/step - loss: 5492.2436
Epoch 8/50
721/721 [=====] - 0s 65us/step - loss: 5136.4744
Epoch 9/50
721/721 [=====] - 0s 43us/step - loss: 4811.2829
Epoch 10/50
721/721 [=====] - 0s 65us/step - loss: 4502.4485
Epoch 11/50
721/721 [=====] - 0s 65us/step - loss: 4200.1570
Epoch 12/50
721/721 [=====] - 0s 65us/step - loss: 3931.9207
Epoch 13/50
721/721 [=====] - 0s 43us/step - loss: 3683.2655
Epoch 14/50
721/721 [=====] - 0s 65us/step - loss: 3436.9796
Epoch 15/50
721/721 [=====] - 0s 65us/step - loss: 3218.0082
Epoch 16/50
721/721 [=====] - 0s 43us/step - loss: 3009.6650
Epoch 17/50
721/721 [=====] - 0s 65us/step - loss: 2826.1689
Epoch 18/50

```

721/721 [=====] - 0s 65us/step - loss: 2648.6634  
 Epoch 19/50  
 721/721 [=====] - 0s 65us/step - loss: 2488.5179  
 Epoch 20/50  
 721/721 [=====] - 0s 43us/step - loss: 2339.9880  
 Epoch 21/50  
 721/721 [=====] - 0s 43us/step - loss: 2199.9024  
 Epoch 22/50  
 721/721 [=====] - 0s 43us/step - loss: 2078.7053  
 Epoch 23/50  
 721/721 [=====] - 0s 65us/step - loss: 1961.4021  
 Epoch 24/50  
 721/721 [=====] - 0s 65us/step - loss: 1856.3577  
 Epoch 25/50  
 721/721 [=====] - 0s 43us/step - loss: 1757.4577  
 Epoch 26/50  
 721/721 [=====] - 0s 65us/step - loss: 1668.7211  
 Epoch 27/50  
 721/721 [=====] - 0s 43us/step - loss: 1588.1550  
 Epoch 28/50  
 721/721 [=====] - 0s 65us/step - loss: 1509.7367  
 Epoch 29/50  
 721/721 [=====] - 0s 43us/step - loss: 1441.2808  
 Epoch 30/50  
 721/721 [=====] - 0s 65us/step - loss: 1382.5812  
 Epoch 31/50  
 721/721 [=====] - 0s 43us/step - loss: 1322.4560  
 Epoch 32/50  
 721/721 [=====] - 0s 43us/step - loss: 1262.5435  
 Epoch 33/50  
 721/721 [=====] - 0s 65us/step - loss: 1212.7205  
 Epoch 34/50  
 721/721 [=====] - 0s 65us/step - loss: 1163.4931  
 Epoch 35/50  
 721/721 [=====] - 0s 43us/step - loss: 1119.7717  
 Epoch 36/50  
 721/721 [=====] - 0s 65us/step - loss: 1079.6788  
 Epoch 37/50  
 721/721 [=====] - 0s 43us/step - loss: 1040.0740  
 Epoch 38/50  
 721/721 [=====] - 0s 43us/step - loss: 1007.6303  
 Epoch 39/50  
 721/721 [=====] - 0s 43us/step - loss: 972.4122  
 Epoch 40/50  
 721/721 [=====] - 0s 43us/step - loss: 942.0606  
 Epoch 41/50  
 721/721 [=====] - 0s 65us/step - loss: 912.6510  
 Epoch 42/50



```

721/721 [=====] - 0s 65us/step - loss: 885.0922
Epoch 43/50
721/721 [=====] - 0s 43us/step - loss: 858.3241
Epoch 44/50
721/721 [=====] - 0s 65us/step - loss: 838.4499
Epoch 45/50
721/721 [=====] - 0s 43us/step - loss: 810.0904
Epoch 46/50
721/721 [=====] - 0s 65us/step - loss: 786.5034
Epoch 47/50
721/721 [=====] - 0s 43us/step - loss: 765.9303
Epoch 48/50
721/721 [=====] - 0s 65us/step - loss: 746.5031
Epoch 49/50
721/721 [=====] - 0s 43us/step - loss: 728.9640
Epoch 50/50
721/721 [=====] - 0s 65us/step - loss: 708.9512
Epoch 1/50
721/721 [=====] - 1s 1ms/step - loss: 28649.8329
Epoch 2/50
721/721 [=====] - 0s 65us/step - loss: 8856.1631
Epoch 3/50
721/721 [=====] - 0s 43us/step - loss: 2535.9262
Epoch 4/50
721/721 [=====] - 0s 65us/step - loss: 1969.8419
Epoch 5/50
721/721 [=====] - 0s 43us/step - loss: 1819.5137
Epoch 6/50
721/721 [=====] - 0s 43us/step - loss: 1685.0840
Epoch 7/50
721/721 [=====] - 0s 65us/step - loss: 1554.9740
Epoch 8/50
721/721 [=====] - ETA: 0s - loss: 1953.30 - 0s
43us/step - loss: 1431.8340
Epoch 9/50
721/721 [=====] - 0s 43us/step - loss: 1318.8766
Epoch 10/50
721/721 [=====] - 0s 43us/step - loss: 1211.1209
Epoch 11/50
721/721 [=====] - 0s 43us/step - loss: 1113.9457
Epoch 12/50
721/721 [=====] - 0s 43us/step - loss: 1023.4140
Epoch 13/50
721/721 [=====] - 0s 65us/step - loss: 945.2294
Epoch 14/50
721/721 [=====] - 0s 43us/step - loss: 870.1332
Epoch 15/50
721/721 [=====] - 0s 65us/step - loss: 801.2774

```

Epoch 16/50  
721/721 [=====] - 0s 43us/step - loss: 735.4927  
Epoch 17/50  
721/721 [=====] - 0s 65us/step - loss: 680.8290  
Epoch 18/50  
721/721 [=====] - 0s 43us/step - loss: 628.7176  
Epoch 19/50  
721/721 [=====] - 0s 65us/step - loss: 584.8680  
Epoch 20/50  
721/721 [=====] - 0s 43us/step - loss: 545.6169  
Epoch 21/50  
721/721 [=====] - 0s 43us/step - loss: 503.6241  
Epoch 22/50  
721/721 [=====] - 0s 43us/step - loss: 473.4526  
Epoch 23/50  
721/721 [=====] - 0s 65us/step - loss: 440.5249  
Epoch 24/50  
721/721 [=====] - 0s 43us/step - loss: 412.5927  
Epoch 25/50  
721/721 [=====] - 0s 65us/step - loss: 387.7067  
Epoch 26/50  
721/721 [=====] - 0s 43us/step - loss: 366.2944  
Epoch 27/50  
721/721 [=====] - 0s 65us/step - loss: 346.9972  
Epoch 28/50  
721/721 [=====] - 0s 43us/step - loss: 328.4388  
Epoch 29/50  
721/721 [=====] - 0s 43us/step - loss: 309.7101  
Epoch 30/50  
721/721 [=====] - 0s 65us/step - loss: 295.9781  
Epoch 31/50  
721/721 [=====] - 0s 43us/step - loss: 281.5957  
Epoch 32/50  
721/721 [=====] - 0s 65us/step - loss: 270.3282  
Epoch 33/50  
721/721 [=====] - 0s 43us/step - loss: 259.0550  
Epoch 34/50  
721/721 [=====] - 0s 65us/step - loss: 250.3009  
Epoch 35/50  
721/721 [=====] - 0s 43us/step - loss: 241.5726  
Epoch 36/50  
721/721 [=====] - 0s 65us/step - loss: 232.0692  
Epoch 37/50  
721/721 [=====] - 0s 43us/step - loss: 225.7947  
Epoch 38/50  
721/721 [=====] - 0s 43us/step - loss: 218.5109  
Epoch 39/50  
721/721 [=====] - 0s 65us/step - loss: 212.5014

Epoch 40/50  
721/721 [=====] - 0s 65us/step - loss: 207.4933  
Epoch 41/50  
721/721 [=====] - 0s 43us/step - loss: 202.0149  
Epoch 42/50  
721/721 [=====] - 0s 43us/step - loss: 197.3385  
Epoch 43/50  
721/721 [=====] - 0s 65us/step - loss: 194.9643  
Epoch 44/50  
721/721 [=====] - 0s 43us/step - loss: 190.1252  
Epoch 45/50  
721/721 [=====] - 0s 65us/step - loss: 187.0583  
Epoch 46/50  
721/721 [=====] - 0s 65us/step - loss: 183.6792  
Epoch 47/50  
721/721 [=====] - 0s 43us/step - loss: 181.1019  
Epoch 48/50  
721/721 [=====] - 0s 65us/step - loss: 179.4566  
Epoch 49/50  
721/721 [=====] - 0s 65us/step - loss: 177.2540  
Epoch 50/50  
721/721 [=====] - 0s 65us/step - loss: 174.4364  
Epoch 1/50  
721/721 [=====] - 1s 1ms/step - loss: 296832.8360  
Epoch 2/50  
721/721 [=====] - 0s 65us/step - loss: 208530.2731  
Epoch 3/50  
721/721 [=====] - 0s 65us/step - loss: 147106.3599  
Epoch 4/50  
721/721 [=====] - 0s 43us/step - loss: 105274.8162  
Epoch 5/50  
721/721 [=====] - 0s 43us/step - loss: 76315.7925  
Epoch 6/50  
721/721 [=====] - 0s 65us/step - loss: 56190.0654  
Epoch 7/50  
721/721 [=====] - 0s 65us/step - loss: 41739.6371  
Epoch 8/50  
721/721 [=====] - 0s 65us/step - loss: 31304.2012  
Epoch 9/50  
721/721 [=====] - 0s 43us/step - loss: 23871.5216  
Epoch 10/50  
721/721 [=====] - 0s 65us/step - loss: 18365.5968  
Epoch 11/50  
721/721 [=====] - 0s 65us/step - loss: 14195.5661  
Epoch 12/50  
721/721 [=====] - 0s 65us/step - loss: 11020.8209  
Epoch 13/50  
721/721 [=====] - 0s 65us/step - loss: 8567.0332

Epoch 14/50  
721/721 [=====] - 0s 65us/step - loss: 6664.4831  
Epoch 15/50  
721/721 [=====] - 0s 43us/step - loss: 5194.2143  
Epoch 16/50  
721/721 [=====] - 0s 43us/step - loss: 4051.1118  
Epoch 17/50  
721/721 [=====] - 0s 79us/step - loss: 3167.1413  
Epoch 18/50  
721/721 [=====] - 0s 65us/step - loss: 2498.4193  
Epoch 19/50  
721/721 [=====] - 0s 65us/step - loss: 1993.3786  
Epoch 20/50  
721/721 [=====] - 0s 65us/step - loss: 1619.2611  
Epoch 21/50  
721/721 [=====] - 0s 65us/step - loss: 1356.0458  
Epoch 22/50  
721/721 [=====] - 0s 65us/step - loss: 1165.5187  
Epoch 23/50  
721/721 [=====] - 0s 65us/step - loss: 1031.8451  
Epoch 24/50  
721/721 [=====] - 0s 43us/step - loss: 941.4512  
Epoch 25/50  
721/721 [=====] - 0s 65us/step - loss: 875.1462  
Epoch 26/50  
721/721 [=====] - 0s 43us/step - loss: 830.7226  
Epoch 27/50  
721/721 [=====] - 0s 65us/step - loss: 799.8890  
Epoch 28/50  
721/721 [=====] - 0s 65us/step - loss: 775.9054  
Epoch 29/50  
721/721 [=====] - 0s 65us/step - loss: 758.8177  
Epoch 30/50  
721/721 [=====] - 0s 65us/step - loss: 744.8693  
Epoch 31/50  
721/721 [=====] - 0s 65us/step - loss: 733.2789  
Epoch 32/50  
721/721 [=====] - 0s 65us/step - loss: 723.3691  
Epoch 33/50  
721/721 [=====] - 0s 43us/step - loss: 713.9988  
Epoch 34/50  
721/721 [=====] - 0s 43us/step - loss: 705.1870  
Epoch 35/50  
721/721 [=====] - 0s 65us/step - loss: 696.8582  
Epoch 36/50  
721/721 [=====] - 0s 65us/step - loss: 688.6982  
Epoch 37/50  
721/721 [=====] - 0s 65us/step - loss: 680.7604

Epoch 38/50  
721/721 [=====] - 0s 65us/step - loss: 672.9366  
Epoch 39/50  
721/721 [=====] - 0s 65us/step - loss: 665.1570  
Epoch 40/50  
721/721 [=====] - 0s 65us/step - loss: 657.3860  
Epoch 41/50  
721/721 [=====] - 0s 65us/step - loss: 649.6569  
Epoch 42/50  
721/721 [=====] - 0s 65us/step - loss: 642.0664  
Epoch 43/50  
721/721 [=====] - 0s 65us/step - loss: 634.5956  
Epoch 44/50  
721/721 [=====] - 0s 43us/step - loss: 627.0225  
Epoch 45/50  
721/721 [=====] - 0s 65us/step - loss: 619.7244  
Epoch 46/50  
721/721 [=====] - 0s 65us/step - loss: 612.1469  
Epoch 47/50  
721/721 [=====] - 0s 87us/step - loss: 604.7150  
Epoch 48/50  
721/721 [=====] - 0s 65us/step - loss: 597.1205  
Epoch 49/50  
721/721 [=====] - 0s 65us/step - loss: 589.6317  
Epoch 50/50  
721/721 [=====] - 0s 43us/step - loss: 582.1690  
Epoch 1/50  
721/721 [=====] - 1s 1ms/step - loss: 419045.5062  
Epoch 2/50  
721/721 [=====] - 0s 65us/step - loss: 257650.9442  
Epoch 3/50  
721/721 [=====] - 0s 43us/step - loss: 161288.6187  
Epoch 4/50  
721/721 [=====] - 0s 65us/step - loss: 104991.7356  
Epoch 5/50  
721/721 [=====] - ETA: 0s - loss: 86993.968 - 0s  
43us/step - loss: 71398.0085  
Epoch 6/50  
721/721 [=====] - 0s 65us/step - loss: 50880.6324  
Epoch 7/50  
721/721 [=====] - 0s 65us/step - loss: 37608.5642  
Epoch 8/50  
721/721 [=====] - 0s 43us/step - loss: 28592.2387  
Epoch 9/50  
721/721 [=====] - 0s 65us/step - loss: 22334.6719  
Epoch 10/50  
721/721 [=====] - 0s 65us/step - loss: 17748.5596  
Epoch 11/50

721/721 [=====] - 0s 43us/step - loss: 14267.4748  
Epoch 12/50  
721/721 [=====] - 0s 43us/step - loss: 11573.7983  
Epoch 13/50  
721/721 [=====] - 0s 43us/step - loss: 9471.0726  
Epoch 14/50  
721/721 [=====] - 0s 65us/step - loss: 7823.6412  
Epoch 15/50  
721/721 [=====] - 0s 65us/step - loss: 6504.1604  
Epoch 16/50  
721/721 [=====] - 0s 65us/step - loss: 5470.0205  
Epoch 17/50  
721/721 [=====] - 0s 65us/step - loss: 4627.9760  
Epoch 18/50  
721/721 [=====] - 0s 65us/step - loss: 3968.3129  
Epoch 19/50  
721/721 [=====] - 0s 43us/step - loss: 3440.1898  
Epoch 20/50  
721/721 [=====] - 0s 43us/step - loss: 3009.7952  
Epoch 21/50  
721/721 [=====] - 0s 65us/step - loss: 2667.1396  
Epoch 22/50  
721/721 [=====] - 0s 65us/step - loss: 2389.5058  
Epoch 23/50  
721/721 [=====] - 0s 65us/step - loss: 2165.4734  
Epoch 24/50  
721/721 [=====] - 0s 65us/step - loss: 1985.0100  
Epoch 25/50  
721/721 [=====] - 0s 65us/step - loss: 1837.0518  
Epoch 26/50  
721/721 [=====] - 0s 65us/step - loss: 1714.4327  
Epoch 27/50  
721/721 [=====] - 0s 43us/step - loss: 1614.8652  
Epoch 28/50  
721/721 [=====] - 0s 65us/step - loss: 1537.4062  
Epoch 29/50  
721/721 [=====] - 0s 65us/step - loss: 1469.8392  
Epoch 30/50  
721/721 [=====] - 0s 65us/step - loss: 1418.3053  
Epoch 31/50  
721/721 [=====] - 0s 65us/step - loss: 1373.5815  
Epoch 32/50  
721/721 [=====] - 0s 65us/step - loss: 1335.6014  
Epoch 33/50  
721/721 [=====] - 0s 65us/step - loss: 1305.0984  
Epoch 34/50  
721/721 [=====] - 0s 65us/step - loss: 1275.5245  
Epoch 35/50

```

721/721 [=====] - 0s 43us/step - loss: 1251.2264
Epoch 36/50
721/721 [=====] - 0s 43us/step - loss: 1229.9143
Epoch 37/50
721/721 [=====] - 0s 65us/step - loss: 1210.2254
Epoch 38/50
721/721 [=====] - 0s 43us/step - loss: 1192.5817
Epoch 39/50
721/721 [=====] - 0s 65us/step - loss: 1175.8359
Epoch 40/50
721/721 [=====] - 0s 65us/step - loss: 1159.1613
Epoch 41/50
721/721 [=====] - 0s 43us/step - loss: 1143.4334
Epoch 42/50
721/721 [=====] - 0s 65us/step - loss: 1127.3472
Epoch 43/50
721/721 [=====] - 0s 65us/step - loss: 1112.0418
Epoch 44/50
721/721 [=====] - 0s 43us/step - loss: 1097.5355
Epoch 45/50
721/721 [=====] - 0s 65us/step - loss: 1083.8176
Epoch 46/50
721/721 [=====] - 0s 65us/step - loss: 1070.0811
Epoch 47/50
721/721 [=====] - 0s 65us/step - loss: 1056.4867
Epoch 48/50
721/721 [=====] - 0s 43us/step - loss: 1043.6133
Epoch 49/50
721/721 [=====] - 0s 65us/step - loss: 1030.5662
Epoch 50/50
721/721 [=====] - 0s 65us/step - loss: 1019.0122
Epoch 1/50
721/721 [=====] - 1s 1ms/step - loss: 57332.5993
Epoch 2/50
721/721 [=====] - 0s 65us/step - loss: 10875.1800
Epoch 3/50
721/721 [=====] - 0s 43us/step - loss: 8330.5004
Epoch 4/50
721/721 [=====] - 0s 65us/step - loss: 7527.6059
Epoch 5/50
721/721 [=====] - 0s 65us/step - loss: 6828.7470
Epoch 6/50
721/721 [=====] - 0s 43us/step - loss: 6253.9932
Epoch 7/50
721/721 [=====] - 0s 65us/step - loss: 5682.3796
Epoch 8/50
721/721 [=====] - 0s 65us/step - loss: 5100.2715
Epoch 9/50

```

721/721 [=====] - 0s 65us/step - loss: 4519.7705  
 Epoch 10/50  
 721/721 [=====] - 0s 43us/step - loss: 4011.3163  
 Epoch 11/50  
 721/721 [=====] - 0s 65us/step - loss: 3504.3824  
 Epoch 12/50  
 721/721 [=====] - 0s 65us/step - loss: 3070.9115  
 Epoch 13/50  
 721/721 [=====] - 0s 65us/step - loss: 2698.8675  
 Epoch 14/50  
 721/721 [=====] - 0s 43us/step - loss: 2361.1635  
 Epoch 15/50  
 721/721 [=====] - 0s 65us/step - loss: 2060.9926  
 Epoch 16/50  
 721/721 [=====] - 0s 65us/step - loss: 1800.4916  
 Epoch 17/50  
 721/721 [=====] - 0s 43us/step - loss: 1591.1127  
 Epoch 18/50  
 721/721 [=====] - 0s 43us/step - loss: 1408.2899  
 Epoch 19/50  
 721/721 [=====] - 0s 65us/step - loss: 1256.1822  
 Epoch 20/50  
 721/721 [=====] - 0s 65us/step - loss: 1122.0758  
 Epoch 21/50  
 721/721 [=====] - 0s 65us/step - loss: 1012.7800  
 Epoch 22/50  
 721/721 [=====] - 0s 43us/step - loss: 918.0753  
 Epoch 23/50  
 721/721 [=====] - 0s 65us/step - loss: 822.5146  
 Epoch 24/50  
 721/721 [=====] - 0s 65us/step - loss: 742.4350  
 Epoch 25/50  
 721/721 [=====] - 0s 65us/step - loss: 677.4237  
 Epoch 26/50  
 721/721 [=====] - 0s 65us/step - loss: 612.0403  
 Epoch 27/50  
 721/721 [=====] - 0s 43us/step - loss: 555.0250  
 Epoch 28/50  
 721/721 [=====] - 0s 87us/step - loss: 507.8546  
 Epoch 29/50  
 721/721 [=====] - 0s 65us/step - loss: 464.0332  
 Epoch 30/50  
 721/721 [=====] - 0s 65us/step - loss: 423.3780  
 Epoch 31/50  
 721/721 [=====] - 0s 43us/step - loss: 389.2852  
 Epoch 32/50  
 721/721 [=====] - 0s 65us/step - loss: 359.9245  
 Epoch 33/50



721/721 [=====] - 0s 87us/step - loss: 333.4798  
 Epoch 34/50  
 721/721 [=====] - 0s 65us/step - loss: 311.3551  
 Epoch 35/50  
 721/721 [=====] - 0s 65us/step - loss: 287.8116  
 Epoch 36/50  
 721/721 [=====] - 0s 65us/step - loss: 267.5302  
 Epoch 37/50  
 721/721 [=====] - 0s 65us/step - loss: 249.7780  
 Epoch 38/50  
 721/721 [=====] - 0s 65us/step - loss: 234.8719  
 Epoch 39/50  
 721/721 [=====] - 0s 43us/step - loss: 221.3237  
 Epoch 40/50  
 721/721 [=====] - 0s 65us/step - loss: 210.2017  
 Epoch 41/50  
 721/721 [=====] - 0s 65us/step - loss: 198.6723  
 Epoch 42/50  
 721/721 [=====] - 0s 43us/step - loss: 191.1543  
 Epoch 43/50  
 721/721 [=====] - 0s 65us/step - loss: 185.6530  
 Epoch 44/50  
 721/721 [=====] - 0s 65us/step - loss: 177.6657  
 Epoch 45/50  
 721/721 [=====] - 0s 43us/step - loss: 169.1130  
 Epoch 46/50  
 721/721 [=====] - 0s 65us/step - loss: 163.0127  
 Epoch 47/50  
 721/721 [=====] - 0s 65us/step - loss: 160.2257  
 Epoch 48/50  
 721/721 [=====] - 0s 65us/step - loss: 156.2409  
 Epoch 49/50  
 721/721 [=====] - 0s 43us/step - loss: 150.3733  
 Epoch 50/50  
 721/721 [=====] - 0s 65us/step - loss: 148.0820  
 Epoch 1/50  
 721/721 [=====] - 1s 1ms/step - loss: 1318.3055  
 Epoch 2/50  
 721/721 [=====] - 0s 43us/step - loss: 561.4931  
 Epoch 3/50  
 721/721 [=====] - 0s 43us/step - loss: 433.7926  
 Epoch 4/50  
 721/721 [=====] - 0s 65us/step - loss: 388.9834  
 Epoch 5/50  
 721/721 [=====] - 0s 65us/step - loss: 356.6961  
 Epoch 6/50  
 721/721 [=====] - 0s 43us/step - loss: 328.9810  
 Epoch 7/50

721/721 [=====] - 0s 65us/step - loss: 301.1916  
 Epoch 8/50  
 721/721 [=====] - 0s 43us/step - loss: 282.1396  
 Epoch 9/50  
 721/721 [=====] - 0s 43us/step - loss: 260.1374  
 Epoch 10/50  
 721/721 [=====] - 0s 65us/step - loss: 239.5962  
 Epoch 11/50  
 721/721 [=====] - 0s 43us/step - loss: 225.8832  
 Epoch 12/50  
 721/721 [=====] - 0s 87us/step - loss: 213.9490  
 Epoch 13/50  
 721/721 [=====] - 0s 43us/step - loss: 204.1706  
 Epoch 14/50  
 721/721 [=====] - 0s 65us/step - loss: 195.9451  
 Epoch 15/50  
 721/721 [=====] - 0s 60us/step - loss: 189.8566  
 Epoch 16/50  
 721/721 [=====] - 0s 43us/step - loss: 180.0256  
 Epoch 17/50  
 721/721 [=====] - 0s 65us/step - loss: 168.7168  
 Epoch 18/50  
 721/721 [=====] - 0s 65us/step - loss: 159.6981  
 Epoch 19/50  
 721/721 [=====] - 0s 43us/step - loss: 150.4186  
 Epoch 20/50  
 721/721 [=====] - 0s 43us/step - loss: 142.0203  
 Epoch 21/50  
 721/721 [=====] - 0s 65us/step - loss: 132.9204  
 Epoch 22/50  
 721/721 [=====] - 0s 43us/step - loss: 125.7651  
 Epoch 23/50  
 721/721 [=====] - 0s 65us/step - loss: 124.3438  
 Epoch 24/50  
 721/721 [=====] - 0s 65us/step - loss: 119.8964  
 Epoch 25/50  
 721/721 [=====] - 0s 65us/step - loss: 116.4730  
 Epoch 26/50  
 721/721 [=====] - 0s 43us/step - loss: 114.0434  
 Epoch 27/50  
 721/721 [=====] - 0s 65us/step - loss: 113.5162  
 Epoch 28/50  
 721/721 [=====] - 0s 43us/step - loss: 111.6750  
 Epoch 29/50  
 721/721 [=====] - 0s 65us/step - loss: 109.1053  
 Epoch 30/50  
 721/721 [=====] - 0s 43us/step - loss: 109.4361  
 Epoch 31/50

```

721/721 [=====] - 0s 65us/step - loss: 109.9213
Epoch 32/50
721/721 [=====] - 0s 43us/step - loss: 106.2497
Epoch 33/50
721/721 [=====] - 0s 43us/step - loss: 106.2089
Epoch 34/50
721/721 [=====] - 0s 65us/step - loss: 104.8596
Epoch 35/50
721/721 [=====] - 0s 65us/step - loss: 104.6249
Epoch 36/50
721/721 [=====] - 0s 65us/step - loss: 105.9095
Epoch 37/50
721/721 [=====] - 0s 43us/step - loss: 102.1574
Epoch 38/50
721/721 [=====] - 0s 65us/step - loss: 100.8100
Epoch 39/50
721/721 [=====] - 0s 65us/step - loss: 103.6624
Epoch 40/50
721/721 [=====] - 0s 43us/step - loss: 102.8366
Epoch 41/50
721/721 [=====] - 0s 65us/step - loss: 100.1981
Epoch 42/50
721/721 [=====] - 0s 65us/step - loss: 99.9984
Epoch 43/50
721/721 [=====] - 0s 65us/step - loss: 99.5454
Epoch 44/50
721/721 [=====] - 0s 43us/step - loss: 98.9529
Epoch 45/50
721/721 [=====] - 0s 43us/step - loss: 100.3473
Epoch 46/50
721/721 [=====] - 0s 87us/step - loss: 99.9242
Epoch 47/50
721/721 [=====] - 0s 43us/step - loss: 97.8739
Epoch 48/50
721/721 [=====] - 0s 65us/step - loss: 96.0244
Epoch 49/50
721/721 [=====] - 0s 65us/step - loss: 98.8073
Epoch 50/50
721/721 [=====] - 0s 43us/step - loss: 95.9006
Epoch 1/50
721/721 [=====] - 1s 1ms/step - loss: 25310.6286
Epoch 2/50
721/721 [=====] - 0s 65us/step - loss: 1894.9456
Epoch 3/50
721/721 [=====] - 0s 65us/step - loss: 746.2535
Epoch 4/50
721/721 [=====] - 0s 65us/step - loss: 563.6310
Epoch 5/50

```

```

721/721 [=====] - 0s 65us/step - loss: 493.0559
Epoch 6/50
721/721 [=====] - 0s 65us/step - loss: 429.9685
Epoch 7/50
721/721 [=====] - 0s 65us/step - loss: 375.1079
Epoch 8/50
721/721 [=====] - 0s 65us/step - loss: 327.9851
Epoch 9/50
721/721 [=====] - 0s 65us/step - loss: 286.6586
Epoch 10/50
721/721 [=====] - 0s 65us/step - loss: 253.1482
Epoch 11/50
721/721 [=====] - 0s 87us/step - loss: 224.3186
Epoch 12/50
721/721 [=====] - 0s 65us/step - loss: 199.5560
Epoch 13/50
721/721 [=====] - 0s 43us/step - loss: 180.6869
Epoch 14/50
721/721 [=====] - 0s 43us/step - loss: 166.1345
Epoch 15/50
721/721 [=====] - 0s 65us/step - loss: 152.1503
Epoch 16/50
721/721 [=====] - 0s 65us/step - loss: 141.8967
Epoch 17/50
721/721 [=====] - 0s 65us/step - loss: 133.6792
Epoch 18/50
721/721 [=====] - 0s 65us/step - loss: 127.0138
Epoch 19/50
721/721 [=====] - 0s 87us/step - loss: 121.4220
Epoch 20/50
721/721 [=====] - 0s 65us/step - loss: 116.8954
Epoch 21/50
721/721 [=====] - 0s 65us/step - loss: 113.0814
Epoch 22/50
721/721 [=====] - 0s 65us/step - loss: 109.4535
Epoch 23/50
721/721 [=====] - 0s 65us/step - loss: 106.7504
Epoch 24/50
721/721 [=====] - 0s 65us/step - loss: 104.1456
Epoch 25/50
721/721 [=====] - 0s 65us/step - loss: 105.0117
Epoch 26/50
721/721 [=====] - 0s 43us/step - loss: 100.7657
Epoch 27/50
721/721 [=====] - 0s 87us/step - loss: 98.4831
Epoch 28/50
721/721 [=====] - 0s 65us/step - loss: 97.2175
Epoch 29/50

```

```

721/721 [=====] - 0s 65us/step - loss: 95.8052
Epoch 30/50
721/721 [=====] - 0s 65us/step - loss: 95.2426
Epoch 31/50
721/721 [=====] - 0s 43us/step - loss: 94.4179
Epoch 32/50
721/721 [=====] - 0s 65us/step - loss: 92.7677
Epoch 33/50
721/721 [=====] - 0s 65us/step - loss: 91.0315
Epoch 34/50
721/721 [=====] - 0s 43us/step - loss: 90.4925
Epoch 35/50
721/721 [=====] - 0s 43us/step - loss: 90.6368
Epoch 36/50
721/721 [=====] - 0s 43us/step - loss: 89.0572
Epoch 37/50
721/721 [=====] - 0s 43us/step - loss: 88.4960
Epoch 38/50
721/721 [=====] - 0s 43us/step - loss: 87.2324
Epoch 39/50
721/721 [=====] - 0s 22us/step - loss: 88.0630
Epoch 40/50
721/721 [=====] - 0s 22us/step - loss: 85.9342
Epoch 41/50
721/721 [=====] - 0s 22us/step - loss: 85.0522
Epoch 42/50
721/721 [=====] - 0s 43us/step - loss: 84.3590
Epoch 43/50
721/721 [=====] - 0s 43us/step - loss: 84.3683
Epoch 44/50
721/721 [=====] - 0s 43us/step - loss: 83.6800
Epoch 45/50
721/721 [=====] - 0s 43us/step - loss: 83.5517
Epoch 46/50
721/721 [=====] - 0s 43us/step - loss: 82.9068
Epoch 47/50
721/721 [=====] - 0s 43us/step - loss: 82.6205
Epoch 48/50
721/721 [=====] - 0s 22us/step - loss: 81.5364
Epoch 49/50
721/721 [=====] - 0s 43us/step - loss: 81.0622
Epoch 50/50
721/721 [=====] - 0s 43us/step - loss: 82.0433
Epoch 1/50
721/721 [=====] - 1s 1ms/step - loss: 2285.2420
Epoch 2/50
721/721 [=====] - 0s 43us/step - loss: 1845.8039
Epoch 3/50

```

```

721/721 [=====] - 0s 43us/step - loss: 1681.7931
Epoch 4/50
721/721 [=====] - 0s 22us/step - loss: 1528.4676
Epoch 5/50
721/721 [=====] - 0s 43us/step - loss: 1394.4763
Epoch 6/50
721/721 [=====] - 0s 43us/step - loss: 1265.0202
Epoch 7/50
721/721 [=====] - 0s 43us/step - loss: 1146.3391
Epoch 8/50
721/721 [=====] - 0s 43us/step - loss: 1039.9017
Epoch 9/50
721/721 [=====] - 0s 22us/step - loss: 940.7581
Epoch 10/50
721/721 [=====] - 0s 43us/step - loss: 860.8991
Epoch 11/50
721/721 [=====] - 0s 43us/step - loss: 768.8856
Epoch 12/50
721/721 [=====] - 0s 43us/step - loss: 700.1878
Epoch 13/50
721/721 [=====] - 0s 43us/step - loss: 636.9466
Epoch 14/50
721/721 [=====] - 0s 43us/step - loss: 566.6311
Epoch 15/50
721/721 [=====] - 0s 22us/step - loss: 511.5864
Epoch 16/50
721/721 [=====] - 0s 43us/step - loss: 462.0459
Epoch 17/50
721/721 [=====] - 0s 43us/step - loss: 416.8628
Epoch 18/50
721/721 [=====] - 0s 43us/step - loss: 379.6686
Epoch 19/50
721/721 [=====] - 0s 43us/step - loss: 342.0550
Epoch 20/50
721/721 [=====] - 0s 43us/step - loss: 312.2321
Epoch 21/50
721/721 [=====] - 0s 22us/step - loss: 287.0937
Epoch 22/50
721/721 [=====] - 0s 43us/step - loss: 267.4525
Epoch 23/50
721/721 [=====] - 0s 46us/step - loss: 249.1497
Epoch 24/50
721/721 [=====] - 0s 43us/step - loss: 232.7971
Epoch 25/50
721/721 [=====] - 0s 22us/step - loss: 214.6428
Epoch 26/50
721/721 [=====] - 0s 22us/step - loss: 203.5139
Epoch 27/50

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721/721 [=====] - 0s 43us/step - loss: 197.4581  
 Epoch 28/50  
 721/721 [=====] - 0s 43us/step - loss: 184.6274  
 Epoch 29/50  
 721/721 [=====] - 0s 43us/step - loss: 177.3565  
 Epoch 30/50  
 721/721 [=====] - 0s 43us/step - loss: 169.8610  
 Epoch 31/50  
 721/721 [=====] - 0s 22us/step - loss: 165.9942  
 Epoch 32/50  
 721/721 [=====] - 0s 22us/step - loss: 163.1898  
 Epoch 33/50  
 721/721 [=====] - 0s 43us/step - loss: 157.2213  
 Epoch 34/50  
 721/721 [=====] - 0s 43us/step - loss: 156.4964  
 Epoch 35/50  
 721/721 [=====] - 0s 43us/step - loss: 154.4739  
 Epoch 36/50  
 721/721 [=====] - 0s 43us/step - loss: 152.8764  
 Epoch 37/50  
 721/721 [=====] - 0s 22us/step - loss: 147.2425  
 Epoch 38/50  
 721/721 [=====] - 0s 58us/step - loss: 150.4067  
 Epoch 39/50  
 721/721 [=====] - 0s 22us/step - loss: 144.6618  
 Epoch 40/50  
 721/721 [=====] - 0s 22us/step - loss: 143.7705  
 Epoch 41/50  
 721/721 [=====] - 0s 43us/step - loss: 144.4112  
 Epoch 42/50  
 721/721 [=====] - 0s 43us/step - loss: 142.9645  
 Epoch 43/50  
 721/721 [=====] - 0s 43us/step - loss: 139.8231  
 Epoch 44/50  
 721/721 [=====] - 0s 43us/step - loss: 137.1876  
 Epoch 45/50  
 721/721 [=====] - 0s 22us/step - loss: 136.0648  
 Epoch 46/50  
 721/721 [=====] - 0s 22us/step - loss: 136.5530  
 Epoch 47/50  
 721/721 [=====] - 0s 48us/step - loss: 134.0649  
 Epoch 48/50  
 721/721 [=====] - 0s 43us/step - loss: 137.9432  
 Epoch 49/50  
 721/721 [=====] - 0s 22us/step - loss: 132.3097  
 Epoch 50/50  
 721/721 [=====] - 0s 43us/step - loss: 132.1953  
 Epoch 1/50

```

721/721 [=====] - 1s 1ms/step - loss: 93535.4120
Epoch 2/50
721/721 [=====] - 0s 65us/step - loss: 42087.3185
Epoch 3/50
721/721 [=====] - 0s 43us/step - loss: 17412.4567
Epoch 4/50
721/721 [=====] - 0s 43us/step - loss: 6868.8951
Epoch 5/50
721/721 [=====] - 0s 43us/step - loss: 2801.1669
Epoch 6/50
721/721 [=====] - 0s 43us/step - loss: 1464.8900
Epoch 7/50
721/721 [=====] - 0s 43us/step - loss: 1109.7291
Epoch 8/50
721/721 [=====] - 0s 43us/step - loss: 1019.8346
Epoch 9/50
721/721 [=====] - 0s 65us/step - loss: 997.1043
Epoch 10/50
721/721 [=====] - 0s 65us/step - loss: 983.3986
Epoch 11/50
721/721 [=====] - 0s 43us/step - loss: 970.8050
Epoch 12/50
721/721 [=====] - 0s 65us/step - loss: 957.7960
Epoch 13/50
721/721 [=====] - 0s 43us/step - loss: 945.2137
Epoch 14/50
721/721 [=====] - 0s 65us/step - loss: 931.8703
Epoch 15/50
721/721 [=====] - 0s 43us/step - loss: 919.1379
Epoch 16/50
721/721 [=====] - 0s 43us/step - loss: 905.8516
Epoch 17/50
721/721 [=====] - 0s 43us/step - loss: 892.0197
Epoch 18/50
721/721 [=====] - 0s 65us/step - loss: 879.6172
Epoch 19/50
721/721 [=====] - 0s 43us/step - loss: 866.0020
Epoch 20/50
721/721 [=====] - 0s 43us/step - loss: 853.1218
Epoch 21/50
721/721 [=====] - 0s 65us/step - loss: 840.1291
Epoch 22/50
721/721 [=====] - 0s 43us/step - loss: 828.1150
Epoch 23/50
721/721 [=====] - 0s 43us/step - loss: 815.0680
Epoch 24/50
721/721 [=====] - 0s 65us/step - loss: 802.5071
Epoch 25/50

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721/721 [=====] - 0s 43us/step - loss: 790.5797  
 Epoch 26/50  
 721/721 [=====] - 0s 65us/step - loss: 777.7530  
 Epoch 27/50  
 721/721 [=====] - 0s 65us/step - loss: 765.6278  
 Epoch 28/50  
 721/721 [=====] - 0s 65us/step - loss: 753.8937  
 Epoch 29/50  
 721/721 [=====] - 0s 43us/step - loss: 742.2175  
 Epoch 30/50  
 721/721 [=====] - 0s 65us/step - loss: 731.1644  
 Epoch 31/50  
 721/721 [=====] - 0s 43us/step - loss: 720.5137  
 Epoch 32/50  
 721/721 [=====] - 0s 65us/step - loss: 707.0350  
 Epoch 33/50  
 721/721 [=====] - 0s 43us/step - loss: 697.5505  
 Epoch 34/50  
 721/721 [=====] - 0s 65us/step - loss: 685.6321  
 Epoch 35/50  
 721/721 [=====] - 0s 65us/step - loss: 675.3891  
 Epoch 36/50  
 721/721 [=====] - 0s 43us/step - loss: 663.4562  
 Epoch 37/50  
 721/721 [=====] - 0s 65us/step - loss: 653.7919  
 Epoch 38/50  
 721/721 [=====] - 0s 43us/step - loss: 644.8889  
 Epoch 39/50  
 721/721 [=====] - 0s 65us/step - loss: 633.2750  
 Epoch 40/50  
 721/721 [=====] - 0s 43us/step - loss: 625.3659  
 Epoch 41/50  
 721/721 [=====] - 0s 65us/step - loss: 615.5903  
 Epoch 42/50  
 721/721 [=====] - 0s 43us/step - loss: 604.7429  
 Epoch 43/50  
 721/721 [=====] - 0s 65us/step - loss: 595.3835  
 Epoch 44/50  
 721/721 [=====] - 0s 65us/step - loss: 586.1750  
 Epoch 45/50  
 721/721 [=====] - 0s 43us/step - loss: 577.4904  
 Epoch 46/50  
 721/721 [=====] - 0s 44us/step - loss: 568.4090  
 Epoch 47/50  
 721/721 [=====] - 0s 43us/step - loss: 559.2872  
 Epoch 48/50  
 721/721 [=====] - 0s 65us/step - loss: 552.1610  
 Epoch 49/50

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721/721 [=====] - 0s 43us/step - loss: 542.9051
Epoch 50/50
721/721 [=====] - 0s 65us/step - loss: 536.0346
Epoch 1/50
721/721 [=====] - 1s 1ms/step - loss: 66105.5939
Epoch 2/50
721/721 [=====] - 0s 43us/step - loss: 11875.4302
Epoch 3/50
721/721 [=====] - 0s 65us/step - loss: 5224.6683
Epoch 4/50
721/721 [=====] - 0s 43us/step - loss: 4194.9092
Epoch 5/50
721/721 [=====] - 0s 44us/step - loss: 3667.9229
Epoch 6/50
721/721 [=====] - 0s 65us/step - loss: 3365.6515
Epoch 7/50
721/721 [=====] - 0s 65us/step - loss: 3125.6753
Epoch 8/50
721/721 [=====] - 0s 43us/step - loss: 2925.0290
Epoch 9/50
721/721 [=====] - 0s 65us/step - loss: 2746.9877
Epoch 10/50
721/721 [=====] - 0s 43us/step - loss: 2587.4805
Epoch 11/50
721/721 [=====] - 0s 65us/step - loss: 2435.4575
Epoch 12/50
721/721 [=====] - 0s 65us/step - loss: 2293.8781
Epoch 13/50
721/721 [=====] - 0s 43us/step - loss: 2159.1707
Epoch 14/50
721/721 [=====] - 0s 43us/step - loss: 2038.7364
Epoch 15/50
721/721 [=====] - 0s 65us/step - loss: 1921.6666
Epoch 16/50
721/721 [=====] - 0s 65us/step - loss: 1811.0454
Epoch 17/50
721/721 [=====] - 0s 43us/step - loss: 1711.2442
Epoch 18/50
721/721 [=====] - 0s 65us/step - loss: 1616.8976
Epoch 19/50
721/721 [=====] - 0s 43us/step - loss: 1532.2333
Epoch 20/50
721/721 [=====] - 0s 65us/step - loss: 1447.0510
Epoch 21/50
721/721 [=====] - 0s 43us/step - loss: 1371.1881
Epoch 22/50
721/721 [=====] - 0s 43us/step - loss: 1302.3720
Epoch 23/50

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```

721/721 [=====] - 0s 65us/step - loss: 1235.4912
Epoch 24/50
721/721 [=====] - 0s 65us/step - loss: 1177.8170
Epoch 25/50
721/721 [=====] - 0s 65us/step - loss: 1114.5723
Epoch 26/50
721/721 [=====] - 0s 43us/step - loss: 1055.6748
Epoch 27/50
721/721 [=====] - 0s 65us/step - loss: 1004.9844
Epoch 28/50
721/721 [=====] - 0s 43us/step - loss: 958.9868
Epoch 29/50
721/721 [=====] - 0s 66us/step - loss: 910.0943
Epoch 30/50
721/721 [=====] - 0s 65us/step - loss: 870.0994
Epoch 31/50
721/721 [=====] - 0s 65us/step - loss: 830.7205
Epoch 32/50
721/721 [=====] - 0s 65us/step - loss: 791.8744
Epoch 33/50
721/721 [=====] - 0s 43us/step - loss: 757.8559
Epoch 34/50
721/721 [=====] - 0s 65us/step - loss: 724.9646
Epoch 35/50
721/721 [=====] - 0s 43us/step - loss: 689.5381
Epoch 36/50
721/721 [=====] - 0s 65us/step - loss: 656.8734
Epoch 37/50
721/721 [=====] - 0s 65us/step - loss: 626.5165
Epoch 38/50
721/721 [=====] - 0s 43us/step - loss: 600.1629
Epoch 39/50
721/721 [=====] - 0s 65us/step - loss: 576.8916
Epoch 40/50
721/721 [=====] - 0s 87us/step - loss: 552.0714
Epoch 41/50
721/721 [=====] - 0s 43us/step - loss: 530.8354
Epoch 42/50
721/721 [=====] - 0s 65us/step - loss: 509.9286
Epoch 43/50
721/721 [=====] - 0s 65us/step - loss: 484.9783
Epoch 44/50
721/721 [=====] - 0s 65us/step - loss: 465.8952
Epoch 45/50
721/721 [=====] - 0s 65us/step - loss: 448.7864
Epoch 46/50
721/721 [=====] - 0s 65us/step - loss: 431.3011
Epoch 47/50

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721/721 [=====] - 0s 43us/step - loss: 411.2334
Epoch 48/50
721/721 [=====] - 0s 65us/step - loss: 397.8592
Epoch 49/50
721/721 [=====] - 0s 87us/step - loss: 381.8680
Epoch 50/50
721/721 [=====] - 0s 65us/step - loss: 364.9341
Epoch 1/50
721/721 [=====] - 1s 1ms/step - loss: 33109.3526
Epoch 2/50
721/721 [=====] - 0s 65us/step - loss: 21438.4689
Epoch 3/50
721/721 [=====] - 0s 43us/step - loss: 12309.2579
Epoch 4/50
721/721 [=====] - 0s 43us/step - loss: 6023.4058
Epoch 5/50
721/721 [=====] - 0s 43us/step - loss: 4167.3230
Epoch 6/50
721/721 [=====] - 0s 65us/step - loss: 3513.5248
Epoch 7/50
721/721 [=====] - 0s 43us/step - loss: 3032.0979
Epoch 8/50
721/721 [=====] - 0s 65us/step - loss: 2651.5010
Epoch 9/50
721/721 [=====] - 0s 65us/step - loss: 2347.7229
Epoch 10/50
721/721 [=====] - 0s 43us/step - loss: 2085.7328
Epoch 11/50
721/721 [=====] - 0s 65us/step - loss: 1870.0998
Epoch 12/50
721/721 [=====] - 0s 65us/step - loss: 1684.9380
Epoch 13/50
721/721 [=====] - 0s 43us/step - loss: 1525.3743
Epoch 14/50
721/721 [=====] - 0s 65us/step - loss: 1387.9845
Epoch 15/50
721/721 [=====] - 0s 65us/step - loss: 1263.5128
Epoch 16/50
721/721 [=====] - 0s 43us/step - loss: 1157.5449
Epoch 17/50
721/721 [=====] - 0s 43us/step - loss: 1063.4167
Epoch 18/50
721/721 [=====] - 0s 65us/step - loss: 980.8152
Epoch 19/50
721/721 [=====] - 0s 43us/step - loss: 906.6268
Epoch 20/50
721/721 [=====] - 0s 65us/step - loss: 839.2517
Epoch 21/50

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721/721 [=====] - 0s 65us/step - loss: 779.3331
Epoch 22/50
721/721 [=====] - 0s 65us/step - loss: 726.0358
Epoch 23/50
721/721 [=====] - 0s 43us/step - loss: 677.9939
Epoch 24/50
721/721 [=====] - 0s 43us/step - loss: 636.7379
Epoch 25/50
721/721 [=====] - 0s 65us/step - loss: 597.2567
Epoch 26/50
721/721 [=====] - 0s 43us/step - loss: 565.5851
Epoch 27/50
721/721 [=====] - 0s 65us/step - loss: 532.1386
Epoch 28/50
721/721 [=====] - 0s 65us/step - loss: 498.7692
Epoch 29/50
721/721 [=====] - 0s 65us/step - loss: 460.7700
Epoch 30/50
721/721 [=====] - 0s 43us/step - loss: 427.5186
Epoch 31/50
721/721 [=====] - 0s 65us/step - loss: 395.9087
Epoch 32/50
721/721 [=====] - 0s 65us/step - loss: 363.6705
Epoch 33/50
721/721 [=====] - 0s 65us/step - loss: 334.3835
Epoch 34/50
721/721 [=====] - 0s 43us/step - loss: 311.0928
Epoch 35/50
721/721 [=====] - 0s 65us/step - loss: 293.0846
Epoch 36/50
721/721 [=====] - 0s 43us/step - loss: 279.4939
Epoch 37/50
721/721 [=====] - 0s 43us/step - loss: 267.8536
Epoch 38/50
721/721 [=====] - 0s 65us/step - loss: 260.1324
Epoch 39/50
721/721 [=====] - 0s 43us/step - loss: 252.7597
Epoch 40/50
721/721 [=====] - 0s 65us/step - loss: 246.0890
Epoch 41/50
721/721 [=====] - 0s 65us/step - loss: 240.0126
Epoch 42/50
721/721 [=====] - 0s 43us/step - loss: 233.9178
Epoch 43/50
721/721 [=====] - 0s 43us/step - loss: 229.6164
Epoch 44/50
721/721 [=====] - 0s 65us/step - loss: 225.0740
Epoch 45/50

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721/721 [=====] - 0s 43us/step - loss: 219.7943
Epoch 46/50
721/721 [=====] - 0s 43us/step - loss: 215.9143
Epoch 47/50
721/721 [=====] - 0s 65us/step - loss: 212.3975
Epoch 48/50
721/721 [=====] - 0s 43us/step - loss: 206.9674
Epoch 49/50
721/721 [=====] - 0s 43us/step - loss: 203.0147
Epoch 50/50
721/721 [=====] - 0s 65us/step - loss: 198.9213
Epoch 1/50
721/721 [=====] - 1s 1ms/step - loss: 26305.5603
Epoch 2/50
721/721 [=====] - 0s 65us/step - loss: 7657.4253
Epoch 3/50
721/721 [=====] - 0s 65us/step - loss: 1932.1017
Epoch 4/50
721/721 [=====] - 0s 65us/step - loss: 1176.4820
Epoch 5/50
721/721 [=====] - 0s 65us/step - loss: 922.5071
Epoch 6/50
721/721 [=====] - 0s 65us/step - loss: 747.4578
Epoch 7/50
721/721 [=====] - 0s 43us/step - loss: 633.9641
Epoch 8/50
721/721 [=====] - 0s 65us/step - loss: 554.1618
Epoch 9/50
721/721 [=====] - 0s 65us/step - loss: 502.5629
Epoch 10/50
721/721 [=====] - 0s 87us/step - loss: 462.9086
Epoch 11/50
721/721 [=====] - 0s 65us/step - loss: 434.5178
Epoch 12/50
721/721 [=====] - 0s 65us/step - loss: 412.9150
Epoch 13/50
721/721 [=====] - 0s 65us/step - loss: 394.9512
Epoch 14/50
721/721 [=====] - 0s 65us/step - loss: 380.9771
Epoch 15/50
721/721 [=====] - 0s 65us/step - loss: 370.2045
Epoch 16/50
721/721 [=====] - 0s 65us/step - loss: 361.4399
Epoch 17/50
721/721 [=====] - 0s 43us/step - loss: 353.7453
Epoch 18/50
721/721 [=====] - 0s 65us/step - loss: 345.9584
Epoch 19/50

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721/721 [=====] - 0s 87us/step - loss: 339.3154
Epoch 20/50
721/721 [=====] - 0s 65us/step - loss: 333.1012
Epoch 21/50
721/721 [=====] - 0s 65us/step - loss: 327.0479
Epoch 22/50
721/721 [=====] - 0s 65us/step - loss: 321.6165
Epoch 23/50
721/721 [=====] - 0s 65us/step - loss: 317.3529
Epoch 24/50
721/721 [=====] - 0s 65us/step - loss: 312.9787
Epoch 25/50
721/721 [=====] - 0s 65us/step - loss: 307.7402
Epoch 26/50
721/721 [=====] - 0s 65us/step - loss: 302.4796
Epoch 27/50
721/721 [=====] - 0s 65us/step - loss: 298.3129
Epoch 28/50
721/721 [=====] - 0s 65us/step - loss: 293.9544
Epoch 29/50
721/721 [=====] - 0s 65us/step - loss: 289.7573
Epoch 30/50
721/721 [=====] - 0s 43us/step - loss: 287.6964
Epoch 31/50
721/721 [=====] - ETA: 0s - loss: 223.650 - 0s
65us/step - loss: 282.7966
Epoch 32/50
721/721 [=====] - 0s 65us/step - loss: 278.4806
Epoch 33/50
721/721 [=====] - 0s 65us/step - loss: 274.1158
Epoch 34/50
721/721 [=====] - 0s 65us/step - loss: 269.7996
Epoch 35/50
721/721 [=====] - 0s 65us/step - loss: 265.6170
Epoch 36/50
721/721 [=====] - 0s 65us/step - loss: 261.3902
Epoch 37/50
721/721 [=====] - 0s 65us/step - loss: 256.8548
Epoch 38/50
721/721 [=====] - 0s 43us/step - loss: 253.0317
Epoch 39/50
721/721 [=====] - 0s 87us/step - loss: 248.8040
Epoch 40/50
721/721 [=====] - 0s 87us/step - loss: 246.0685
Epoch 41/50
721/721 [=====] - 0s 65us/step - loss: 242.7447
Epoch 42/50
721/721 [=====] - 0s 65us/step - loss: 239.9215

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Epoch 43/50  
721/721 [=====] - 0s 65us/step - loss: 237.1731  
Epoch 44/50  
721/721 [=====] - 0s 65us/step - loss: 235.0104  
Epoch 45/50  
721/721 [=====] - 0s 65us/step - loss: 232.5369  
Epoch 46/50  
721/721 [=====] - 0s 65us/step - loss: 229.9325  
Epoch 47/50  
721/721 [=====] - 0s 65us/step - loss: 227.7892  
Epoch 48/50  
721/721 [=====] - 0s 65us/step - loss: 225.0957  
Epoch 49/50  
721/721 [=====] - 0s 65us/step - loss: 222.9703  
Epoch 50/50  
721/721 [=====] - 0s 65us/step - loss: 221.0656  
Epoch 1/50  
721/721 [=====] - 1s 2ms/step - loss: 3975.6810  
Epoch 2/50  
721/721 [=====] - 0s 65us/step - loss: 2991.4348  
Epoch 3/50  
721/721 [=====] - 0s 65us/step - loss: 2368.9717  
Epoch 4/50  
721/721 [=====] - 0s 43us/step - loss: 1902.3777  
Epoch 5/50  
721/721 [=====] - 0s 65us/step - loss: 1560.6607  
Epoch 6/50  
721/721 [=====] - 0s 65us/step - loss: 1275.3439  
Epoch 7/50  
721/721 [=====] - 0s 65us/step - loss: 1058.7220  
Epoch 8/50  
721/721 [=====] - 0s 87us/step - loss: 880.4772  
Epoch 9/50  
721/721 [=====] - 0s 65us/step - loss: 749.9726  
Epoch 10/50  
721/721 [=====] - 0s 65us/step - loss: 621.2600  
Epoch 11/50  
721/721 [=====] - 0s 43us/step - loss: 524.7394  
Epoch 12/50  
721/721 [=====] - 0s 65us/step - loss: 460.0270  
Epoch 13/50  
721/721 [=====] - 0s 43us/step - loss: 398.5933  
Epoch 14/50  
721/721 [=====] - 0s 43us/step - loss: 350.8611  
Epoch 15/50  
721/721 [=====] - 0s 65us/step - loss: 310.7392  
Epoch 16/50  
721/721 [=====] - 0s 87us/step - loss: 279.3428



Epoch 17/50  
721/721 [=====] - 0s 65us/step - loss: 255.2592  
Epoch 18/50  
721/721 [=====] - 0s 65us/step - loss: 233.9870  
Epoch 19/50  
721/721 [=====] - 0s 43us/step - loss: 216.7962  
Epoch 20/50  
721/721 [=====] - 0s 65us/step - loss: 203.9660  
Epoch 21/50  
721/721 [=====] - 0s 65us/step - loss: 190.4072  
Epoch 22/50  
721/721 [=====] - 0s 87us/step - loss: 179.7555  
Epoch 23/50  
721/721 [=====] - 0s 65us/step - loss: 172.9461  
Epoch 24/50  
721/721 [=====] - 0s 65us/step - loss: 163.4072  
Epoch 25/50  
721/721 [=====] - 0s 87us/step - loss: 159.0953  
Epoch 26/50  
721/721 [=====] - 0s 65us/step - loss: 154.2089  
Epoch 27/50  
721/721 [=====] - 0s 65us/step - loss: 149.2860  
Epoch 28/50  
721/721 [=====] - 0s 66us/step - loss: 146.7568  
Epoch 29/50  
721/721 [=====] - 0s 65us/step - loss: 139.6232  
Epoch 30/50  
721/721 [=====] - 0s 65us/step - loss: 136.5101  
Epoch 31/50  
721/721 [=====] - 0s 65us/step - loss: 134.9909  
Epoch 32/50  
721/721 [=====] - 0s 65us/step - loss: 132.4794  
Epoch 33/50  
721/721 [=====] - 0s 65us/step - loss: 129.9299  
Epoch 34/50  
721/721 [=====] - 0s 65us/step - loss: 128.5343  
Epoch 35/50  
721/721 [=====] - 0s 65us/step - loss: 128.3092  
Epoch 36/50  
721/721 [=====] - 0s 65us/step - loss: 125.9678  
Epoch 37/50  
721/721 [=====] - 0s 65us/step - loss: 124.7909  
Epoch 38/50  
721/721 [=====] - 0s 43us/step - loss: 124.0642  
Epoch 39/50  
721/721 [=====] - 0s 43us/step - loss: 124.7690  
Epoch 40/50  
721/721 [=====] - 0s 43us/step - loss: 122.4544

Epoch 41/50  
 721/721 [=====] - 0s 65us/step - loss: 121.5029  
 Epoch 42/50  
 721/721 [=====] - 0s 87us/step - loss: 119.8265  
 Epoch 43/50  
 721/721 [=====] - 0s 65us/step - loss: 122.2206  
 Epoch 44/50  
 721/721 [=====] - 0s 65us/step - loss: 122.5756  
 Epoch 45/50  
 721/721 [=====] - 0s 65us/step - loss: 119.5231  
 Epoch 46/50  
 721/721 [=====] - 0s 65us/step - loss: 119.7462  
 Epoch 47/50  
 721/721 [=====] - 0s 65us/step - loss: 116.5913  
 Epoch 48/50  
 721/721 [=====] - 0s 43us/step - loss: 118.0075  
 Epoch 49/50  
 721/721 [=====] - 0s 65us/step - loss: 118.2756  
 Epoch 50/50  
 721/721 [=====] - 0s 65us/step - loss: 117.6834  
 Epoch 1/50  
 721/721 [=====] - 1s 2ms/step - loss: 64173.2050  
 Epoch 2/50  
 721/721 [=====] - 0s 87us/step - loss: 20589.3997  
 Epoch 3/50  
 721/721 [=====] - 0s 65us/step - loss: 5766.0493  
 Epoch 4/50  
 721/721 [=====] - 0s 65us/step - loss: 2709.3815  
 Epoch 5/50  
 721/721 [=====] - 0s 87us/step - loss: 2337.1637  
 Epoch 6/50  
 721/721 [=====] - 0s 43us/step - loss: 2289.8351  
 Epoch 7/50  
 721/721 [=====] - 0s 65us/step - loss: 2239.3009  
 Epoch 8/50  
 721/721 [=====] - 0s 43us/step - loss: 2189.7293  
 Epoch 9/50  
 721/721 [=====] - 0s 65us/step - loss: 2142.6992  
 Epoch 10/50  
 721/721 [=====] - 0s 65us/step - loss: 2093.5977  
 Epoch 11/50  
 721/721 [=====] - 0s 65us/step - loss: 2043.4152  
 Epoch 12/50  
 721/721 [=====] - 0s 65us/step - loss: 1999.1099  
 Epoch 13/50  
 721/721 [=====] - 0s 65us/step - loss: 1950.3499  
 Epoch 14/50  
 721/721 [=====] - 0s 87us/step - loss: 1907.8222

Epoch 15/50  
721/721 [=====] - 0s 65us/step - loss: 1860.4871  
Epoch 16/50  
721/721 [=====] - 0s 65us/step - loss: 1811.7314  
Epoch 17/50  
721/721 [=====] - 0s 65us/step - loss: 1764.9316  
Epoch 18/50  
721/721 [=====] - 0s 65us/step - loss: 1723.5056  
Epoch 19/50  
721/721 [=====] - 0s 65us/step - loss: 1679.4431  
Epoch 20/50  
721/721 [=====] - 0s 65us/step - loss: 1634.4425  
Epoch 21/50  
721/721 [=====] - 0s 65us/step - loss: 1596.9806  
Epoch 22/50  
721/721 [=====] - 0s 87us/step - loss: 1557.6790  
Epoch 23/50  
721/721 [=====] - 0s 87us/step - loss: 1508.0818  
Epoch 24/50  
721/721 [=====] - 0s 65us/step - loss: 1467.6185  
Epoch 25/50  
721/721 [=====] - 0s 65us/step - loss: 1423.8462  
Epoch 26/50  
721/721 [=====] - 0s 65us/step - loss: 1385.1058  
Epoch 27/50  
721/721 [=====] - 0s 65us/step - loss: 1345.5962  
Epoch 28/50  
721/721 [=====] - 0s 65us/step - loss: 1305.9157  
Epoch 29/50  
721/721 [=====] - 0s 65us/step - loss: 1268.4264  
Epoch 30/50  
721/721 [=====] - 0s 65us/step - loss: 1228.1071  
Epoch 31/50  
721/721 [=====] - 0s 87us/step - loss: 1192.2860  
Epoch 32/50  
721/721 [=====] - 0s 65us/step - loss: 1153.2970  
Epoch 33/50  
721/721 [=====] - 0s 87us/step - loss: 1117.5395  
Epoch 34/50  
721/721 [=====] - 0s 65us/step - loss: 1083.7309  
Epoch 35/50  
721/721 [=====] - 0s 43us/step - loss: 1049.6474  
Epoch 36/50  
721/721 [=====] - 0s 65us/step - loss: 1018.1703  
Epoch 37/50  
721/721 [=====] - 0s 65us/step - loss: 989.5593  
Epoch 38/50  
721/721 [=====] - 0s 43us/step - loss: 962.9819

Epoch 39/50  
721/721 [=====] - 0s 87us/step - loss: 931.1219  
Epoch 40/50  
721/721 [=====] - 0s 43us/step - loss: 904.4435  
Epoch 41/50  
721/721 [=====] - 0s 65us/step - loss: 877.5133  
Epoch 42/50  
721/721 [=====] - 0s 65us/step - loss: 851.8125  
Epoch 43/50  
721/721 [=====] - 0s 65us/step - loss: 828.9434  
Epoch 44/50  
721/721 [=====] - 0s 65us/step - loss: 803.2989  
Epoch 45/50  
721/721 [=====] - 0s 43us/step - loss: 782.0942  
Epoch 46/50  
721/721 [=====] - 0s 43us/step - loss: 759.7609  
Epoch 47/50  
721/721 [=====] - 0s 43us/step - loss: 736.8897  
Epoch 48/50  
721/721 [=====] - 0s 87us/step - loss: 717.0396  
Epoch 49/50  
721/721 [=====] - 0s 65us/step - loss: 696.8900  
Epoch 50/50  
721/721 [=====] - 0s 65us/step - loss: 678.5243  
Epoch 1/50  
721/721 [=====] - 1s 2ms/step - loss: 13821.6273  
Epoch 2/50  
721/721 [=====] - 0s 65us/step - loss: 2453.4828  
Epoch 3/50  
721/721 [=====] - 0s 65us/step - loss: 1521.9661  
Epoch 4/50  
721/721 [=====] - 0s 65us/step - loss: 1103.9779  
Epoch 5/50  
721/721 [=====] - 0s 65us/step - loss: 736.6571  
Epoch 6/50  
721/721 [=====] - 0s 87us/step - loss: 521.7278  
Epoch 7/50  
721/721 [=====] - 0s 43us/step - loss: 405.5226  
Epoch 8/50  
721/721 [=====] - 0s 43us/step - loss: 326.0864  
Epoch 9/50  
721/721 [=====] - 0s 43us/step - loss: 267.8923  
Epoch 10/50  
721/721 [=====] - 0s 87us/step - loss: 229.4626  
Epoch 11/50  
721/721 [=====] - 0s 65us/step - loss: 199.6865  
Epoch 12/50  
721/721 [=====] - 0s 65us/step - loss: 179.4160

Epoch 13/50  
721/721 [=====] - 0s 65us/step - loss: 165.1602  
Epoch 14/50  
721/721 [=====] - 0s 65us/step - loss: 154.3482  
Epoch 15/50  
721/721 [=====] - 0s 65us/step - loss: 146.4117  
Epoch 16/50  
721/721 [=====] - 0s 65us/step - loss: 140.5098  
Epoch 17/50  
721/721 [=====] - 0s 43us/step - loss: 135.3871  
Epoch 18/50  
721/721 [=====] - 0s 65us/step - loss: 132.1996  
Epoch 19/50  
721/721 [=====] - 0s 65us/step - loss: 128.7955  
Epoch 20/50  
721/721 [=====] - 0s 87us/step - loss: 127.7311  
Epoch 21/50  
721/721 [=====] - 0s 65us/step - loss: 125.4666  
Epoch 22/50  
721/721 [=====] - 0s 87us/step - loss: 123.5105  
Epoch 23/50  
721/721 [=====] - 0s 65us/step - loss: 122.3887  
Epoch 24/50  
721/721 [=====] - 0s 65us/step - loss: 123.3524  
Epoch 25/50  
721/721 [=====] - 0s 65us/step - loss: 121.3633  
Epoch 26/50  
721/721 [=====] - 0s 65us/step - loss: 120.1019  
Epoch 27/50  
721/721 [=====] - 0s 43us/step - loss: 120.7898  
Epoch 28/50  
721/721 [=====] - 0s 65us/step - loss: 119.1704  
Epoch 29/50  
721/721 [=====] - 0s 65us/step - loss: 119.3260  
Epoch 30/50  
721/721 [=====] - 0s 65us/step - loss: 118.0385  
Epoch 31/50  
721/721 [=====] - 0s 87us/step - loss: 117.3566  
Epoch 32/50  
721/721 [=====] - 0s 65us/step - loss: 117.2600  
Epoch 33/50  
721/721 [=====] - 0s 65us/step - loss: 116.5587  
Epoch 34/50  
721/721 [=====] - 0s 65us/step - loss: 116.4875  
Epoch 35/50  
721/721 [=====] - 0s 65us/step - loss: 116.0331  
Epoch 36/50  
721/721 [=====] - 0s 65us/step - loss: 114.9156

Epoch 37/50  
721/721 [=====] - 0s 65us/step - loss: 115.7129  
Epoch 38/50  
721/721 [=====] - 0s 43us/step - loss: 116.5093  
Epoch 39/50  
721/721 [=====] - 0s 87us/step - loss: 115.5019  
Epoch 40/50  
721/721 [=====] - 0s 65us/step - loss: 114.5210  
Epoch 41/50  
721/721 [=====] - 0s 65us/step - loss: 116.5101  
Epoch 42/50  
721/721 [=====] - 0s 65us/step - loss: 113.4721  
Epoch 43/50  
721/721 [=====] - 0s 87us/step - loss: 114.2264  
Epoch 44/50  
721/721 [=====] - 0s 65us/step - loss: 112.8048  
Epoch 45/50  
721/721 [=====] - 0s 43us/step - loss: 112.8351  
Epoch 46/50  
721/721 [=====] - 0s 65us/step - loss: 113.2407  
Epoch 47/50  
721/721 [=====] - 0s 65us/step - loss: 112.4290  
Epoch 48/50  
721/721 [=====] - 0s 65us/step - loss: 113.0162  
Epoch 49/50  
721/721 [=====] - 0s 65us/step - loss: 111.9122  
Epoch 50/50  
721/721 [=====] - 0s 65us/step - loss: 110.6403  
Epoch 1/50  
721/721 [=====] - 1s 2ms/step - loss: 19611.5035  
Epoch 2/50  
721/721 [=====] - 0s 65us/step - loss: 2661.4426  
Epoch 3/50  
721/721 [=====] - 0s 65us/step - loss: 456.0797  
Epoch 4/50  
721/721 [=====] - 0s 65us/step - loss: 437.5922  
Epoch 5/50  
721/721 [=====] - 0s 65us/step - loss: 397.0716  
Epoch 6/50  
721/721 [=====] - 0s 65us/step - loss: 377.2804  
Epoch 7/50  
721/721 [=====] - 0s 43us/step - loss: 360.2699  
Epoch 8/50  
721/721 [=====] - 0s 87us/step - loss: 342.8190  
Epoch 9/50  
721/721 [=====] - 0s 65us/step - loss: 325.7547  
Epoch 10/50  
721/721 [=====] - 0s 65us/step - loss: 310.4177

Epoch 11/50  
721/721 [=====] - 0s 43us/step - loss: 296.0757  
Epoch 12/50  
721/721 [=====] - 0s 65us/step - loss: 282.8700  
Epoch 13/50  
721/721 [=====] - 0s 65us/step - loss: 270.2572  
Epoch 14/50  
721/721 [=====] - 0s 43us/step - loss: 259.5904  
Epoch 15/50  
721/721 [=====] - 0s 65us/step - loss: 249.9780  
Epoch 16/50  
721/721 [=====] - 0s 65us/step - loss: 241.8195  
Epoch 17/50  
721/721 [=====] - 0s 65us/step - loss: 232.8848  
Epoch 18/50  
721/721 [=====] - 0s 43us/step - loss: 226.7455  
Epoch 19/50  
721/721 [=====] - 0s 43us/step - loss: 220.7198  
Epoch 20/50  
721/721 [=====] - 0s 65us/step - loss: 216.1451  
Epoch 21/50  
721/721 [=====] - 0s 65us/step - loss: 212.1665  
Epoch 22/50  
721/721 [=====] - 0s 65us/step - loss: 206.3935  
Epoch 23/50  
721/721 [=====] - 0s 87us/step - loss: 202.2573  
Epoch 24/50  
721/721 [=====] - 0s 65us/step - loss: 199.4101  
Epoch 25/50  
721/721 [=====] - 0s 65us/step - loss: 196.3143  
Epoch 26/50  
721/721 [=====] - 0s 87us/step - loss: 194.1644  
Epoch 27/50  
721/721 [=====] - 0s 65us/step - loss: 191.1295  
Epoch 28/50  
721/721 [=====] - 0s 65us/step - loss: 188.7311  
Epoch 29/50  
721/721 [=====] - 0s 65us/step - loss: 186.9618  
Epoch 30/50  
721/721 [=====] - 0s 65us/step - loss: 185.0058  
Epoch 31/50  
721/721 [=====] - 0s 43us/step - loss: 184.8222  
Epoch 32/50  
721/721 [=====] - 0s 65us/step - loss: 181.8963  
Epoch 33/50  
721/721 [=====] - 0s 87us/step - loss: 179.5692  
Epoch 34/50  
721/721 [=====] - 0s 65us/step - loss: 178.8843

Epoch 35/50  
721/721 [=====] - 0s 65us/step - loss: 177.3614  
Epoch 36/50  
721/721 [=====] - 0s 65us/step - loss: 175.8659  
Epoch 37/50  
721/721 [=====] - 0s 65us/step - loss: 174.4022  
Epoch 38/50  
721/721 [=====] - 0s 65us/step - loss: 173.0222  
Epoch 39/50  
721/721 [=====] - 0s 43us/step - loss: 171.4904  
Epoch 40/50  
721/721 [=====] - 0s 87us/step - loss: 170.3280  
Epoch 41/50  
721/721 [=====] - 0s 87us/step - loss: 169.2885  
Epoch 42/50  
721/721 [=====] - 0s 65us/step - loss: 167.6920  
Epoch 43/50  
721/721 [=====] - 0s 87us/step - loss: 166.6944  
Epoch 44/50  
721/721 [=====] - 0s 65us/step - loss: 166.0990  
Epoch 45/50  
721/721 [=====] - 0s 65us/step - loss: 164.2769  
Epoch 46/50  
721/721 [=====] - 0s 43us/step - loss: 163.0103  
Epoch 47/50  
721/721 [=====] - 0s 65us/step - loss: 161.0343  
Epoch 48/50  
721/721 [=====] - 0s 65us/step - loss: 160.3864  
Epoch 49/50  
721/721 [=====] - 0s 43us/step - loss: 158.4664  
Epoch 50/50  
721/721 [=====] - 0s 65us/step - loss: 159.1780  
Epoch 1/50  
721/721 [=====] - 1s 2ms/step - loss: 32962.7965  
Epoch 2/50  
721/721 [=====] - 0s 65us/step - loss: 6234.3715  
Epoch 3/50  
721/721 [=====] - 0s 65us/step - loss: 5194.9709  
Epoch 4/50  
721/721 [=====] - 0s 65us/step - loss: 4761.3232  
Epoch 5/50  
721/721 [=====] - 0s 65us/step - loss: 4523.0118  
Epoch 6/50  
721/721 [=====] - 0s 65us/step - loss: 4352.7438  
Epoch 7/50  
721/721 [=====] - 0s 65us/step - loss: 4185.4787  
Epoch 8/50  
721/721 [=====] - 0s 65us/step - loss: 4015.3736



Epoch 9/50  
721/721 [=====] - 0s 43us/step - loss: 3857.9399  
Epoch 10/50  
721/721 [=====] - 0s 43us/step - loss: 3701.1971  
Epoch 11/50  
721/721 [=====] - 0s 65us/step - loss: 3525.6327  
Epoch 12/50  
721/721 [=====] - 0s 65us/step - loss: 3358.5446  
Epoch 13/50  
721/721 [=====] - 0s 43us/step - loss: 3218.0153  
Epoch 14/50  
721/721 [=====] - 0s 87us/step - loss: 3067.7820  
Epoch 15/50  
721/721 [=====] - 0s 43us/step - loss: 2927.0225  
Epoch 16/50  
721/721 [=====] - 0s 65us/step - loss: 2800.0943  
Epoch 17/50  
721/721 [=====] - 0s 87us/step - loss: 2673.2066  
Epoch 18/50  
721/721 [=====] - 0s 65us/step - loss: 2548.3858  
Epoch 19/50  
721/721 [=====] - 0s 65us/step - loss: 2438.3815  
Epoch 20/50  
721/721 [=====] - 0s 65us/step - loss: 2332.9369  
Epoch 21/50  
721/721 [=====] - 0s 65us/step - loss: 2224.4046  
Epoch 22/50  
721/721 [=====] - 0s 43us/step - loss: 2138.2526  
Epoch 23/50  
721/721 [=====] - 0s 65us/step - loss: 2032.6300  
Epoch 24/50  
721/721 [=====] - 0s 65us/step - loss: 1930.5557  
Epoch 25/50  
721/721 [=====] - 0s 65us/step - loss: 1847.5853  
Epoch 26/50  
721/721 [=====] - 0s 65us/step - loss: 1758.9172  
Epoch 27/50  
721/721 [=====] - 0s 65us/step - loss: 1673.4776  
Epoch 28/50  
721/721 [=====] - 0s 43us/step - loss: 1600.1202  
Epoch 29/50  
721/721 [=====] - 0s 65us/step - loss: 1540.7587  
Epoch 30/50  
721/721 [=====] - 0s 65us/step - loss: 1450.5735  
Epoch 31/50  
721/721 [=====] - 0s 65us/step - loss: 1385.9587  
Epoch 32/50  
721/721 [=====] - 0s 43us/step - loss: 1327.9809

Epoch 33/50  
721/721 [=====] - 0s 65us/step - loss: 1272.5172  
Epoch 34/50  
721/721 [=====] - 0s 43us/step - loss: 1198.1283  
Epoch 35/50  
721/721 [=====] - 0s 65us/step - loss: 1147.7938  
Epoch 36/50  
721/721 [=====] - 0s 65us/step - loss: 1096.9975  
Epoch 37/50  
721/721 [=====] - 0s 65us/step - loss: 1052.6574  
Epoch 38/50  
721/721 [=====] - 0s 65us/step - loss: 1001.6495  
Epoch 39/50  
721/721 [=====] - 0s 43us/step - loss: 961.1473  
Epoch 40/50  
721/721 [=====] - 0s 65us/step - loss: 908.4584  
Epoch 41/50  
721/721 [=====] - 0s 65us/step - loss: 868.3807  
Epoch 42/50  
721/721 [=====] - 0s 65us/step - loss: 830.6900  
Epoch 43/50  
721/721 [=====] - 0s 65us/step - loss: 793.1354  
Epoch 44/50  
721/721 [=====] - 0s 43us/step - loss: 754.6601  
Epoch 45/50  
721/721 [=====] - 0s 65us/step - loss: 723.9717  
Epoch 46/50  
721/721 [=====] - 0s 65us/step - loss: 694.6319  
Epoch 47/50  
721/721 [=====] - 0s 65us/step - loss: 665.1072  
Epoch 48/50  
721/721 [=====] - 0s 65us/step - loss: 642.1688  
Epoch 49/50  
721/721 [=====] - 0s 43us/step - loss: 616.6219  
Epoch 50/50  
721/721 [=====] - 0s 87us/step - loss: 600.8881  
Epoch 1/50  
721/721 [=====] - 1s 2ms/step - loss: 65609.0792  
Epoch 2/50  
721/721 [=====] - 0s 108us/step - loss: 18303.8630  
Epoch 3/50  
721/721 [=====] - 0s 65us/step - loss: 4163.8469  
Epoch 4/50  
721/721 [=====] - 0s 65us/step - loss: 1881.9166  
Epoch 5/50  
721/721 [=====] - 0s 65us/step - loss: 1627.0999  
Epoch 6/50  
721/721 [=====] - 0s 65us/step - loss: 1580.2128

Epoch 7/50  
721/721 [=====] - 0s 65us/step - loss: 1534.0627  
Epoch 8/50  
721/721 [=====] - 0s 65us/step - loss: 1486.2736  
Epoch 9/50  
721/721 [=====] - 0s 87us/step - loss: 1439.6577  
Epoch 10/50  
721/721 [=====] - 0s 65us/step - loss: 1390.8603  
Epoch 11/50  
721/721 [=====] - 0s 43us/step - loss: 1343.1280  
Epoch 12/50  
721/721 [=====] - 0s 65us/step - loss: 1296.2488  
Epoch 13/50  
721/721 [=====] - 0s 65us/step - loss: 1250.6290  
Epoch 14/50  
721/721 [=====] - 0s 43us/step - loss: 1206.3648  
Epoch 15/50  
721/721 [=====] - 0s 65us/step - loss: 1161.2179  
Epoch 16/50  
721/721 [=====] - 0s 43us/step - loss: 1120.0304  
Epoch 17/50  
721/721 [=====] - 0s 43us/step - loss: 1079.3537  
Epoch 18/50  
721/721 [=====] - 0s 43us/step - loss: 1039.1506  
Epoch 19/50  
721/721 [=====] - 0s 65us/step - loss: 1001.4515  
Epoch 20/50  
721/721 [=====] - 0s 43us/step - loss: 965.6614  
Epoch 21/50  
721/721 [=====] - 0s 43us/step - loss: 931.1258  
Epoch 22/50  
721/721 [=====] - 0s 43us/step - loss: 899.3876  
Epoch 23/50  
721/721 [=====] - 0s 43us/step - loss: 866.6814  
Epoch 24/50  
721/721 [=====] - 0s 43us/step - loss: 836.0117  
Epoch 25/50  
721/721 [=====] - 0s 43us/step - loss: 807.3092  
Epoch 26/50  
721/721 [=====] - 0s 43us/step - loss: 779.4565  
Epoch 27/50  
721/721 [=====] - 0s 43us/step - loss: 754.6430  
Epoch 28/50  
721/721 [=====] - 0s 43us/step - loss: 731.6218  
Epoch 29/50  
721/721 [=====] - 0s 43us/step - loss: 706.1818  
Epoch 30/50  
721/721 [=====] - 0s 27us/step - loss: 677.9349

Epoch 31/50  
 721/721 [=====] - 0s 43us/step - loss: 654.8443  
 Epoch 32/50  
 721/721 [=====] - 0s 43us/step - loss: 633.9510  
 Epoch 33/50  
 721/721 [=====] - 0s 43us/step - loss: 611.2658  
 Epoch 34/50  
 721/721 [=====] - 0s 22us/step - loss: 589.2077  
 Epoch 35/50  
 721/721 [=====] - 0s 22us/step - loss: 567.4296  
 Epoch 36/50  
 721/721 [=====] - 0s 22us/step - loss: 547.3338  
 Epoch 37/50  
 721/721 [=====] - 0s 43us/step - loss: 522.9500  
 Epoch 38/50  
 721/721 [=====] - 0s 43us/step - loss: 503.6509  
 Epoch 39/50  
 721/721 [=====] - 0s 43us/step - loss: 479.6194  
 Epoch 40/50  
 721/721 [=====] - 0s 43us/step - loss: 456.4788  
 Epoch 41/50  
 721/721 [=====] - 0s 43us/step - loss: 432.6575  
 Epoch 42/50  
 721/721 [=====] - 0s 43us/step - loss: 409.3493  
 Epoch 43/50  
 721/721 [=====] - 0s 43us/step - loss: 385.8616  
 Epoch 44/50  
 721/721 [=====] - 0s 43us/step - loss: 364.3265  
 Epoch 45/50  
 721/721 [=====] - 0s 43us/step - loss: 343.1169  
 Epoch 46/50  
 721/721 [=====] - 0s 43us/step - loss: 325.0378  
 Epoch 47/50  
 721/721 [=====] - 0s 43us/step - loss: 307.4590  
 Epoch 48/50  
 721/721 [=====] - 0s 43us/step - loss: 293.1263  
 Epoch 49/50  
 721/721 [=====] - 0s 43us/step - loss: 275.9261  
 Epoch 50/50  
 721/721 [=====] - 0s 43us/step - loss: 264.1448  
 Epoch 1/50  
 721/721 [=====] - 1s 2ms/step - loss: 216067.4565  
 Epoch 2/50  
 721/721 [=====] - 0s 43us/step - loss: 133958.5999  
 Epoch 3/50  
 721/721 [=====] - 0s 43us/step - loss: 85827.6846  
 Epoch 4/50  
 721/721 [=====] - 0s 47us/step - loss: 55031.0103

Epoch 5/50  
721/721 [=====] - 0s 30us/step - loss: 33565.4542  
Epoch 6/50  
721/721 [=====] - 0s 43us/step - loss: 18887.1678  
Epoch 7/50  
721/721 [=====] - 0s 43us/step - loss: 9581.5686  
Epoch 8/50  
721/721 [=====] - 0s 43us/step - loss: 4391.6491  
Epoch 9/50  
721/721 [=====] - 0s 43us/step - loss: 1977.7319  
Epoch 10/50  
721/721 [=====] - 0s 43us/step - loss: 1058.4916  
Epoch 11/50  
721/721 [=====] - 0s 43us/step - loss: 776.4210  
Epoch 12/50  
721/721 [=====] - 0s 43us/step - loss: 693.6549  
Epoch 13/50  
721/721 [=====] - 0s 43us/step - loss: 660.3342  
Epoch 14/50  
721/721 [=====] - 0s 43us/step - loss: 633.5643  
Epoch 15/50  
721/721 [=====] - 0s 43us/step - loss: 609.6166  
Epoch 16/50  
721/721 [=====] - 0s 43us/step - loss: 587.3501  
Epoch 17/50  
721/721 [=====] - 0s 43us/step - loss: 565.6159  
Epoch 18/50  
721/721 [=====] - 0s 43us/step - loss: 545.2026  
Epoch 19/50  
721/721 [=====] - 0s 43us/step - loss: 524.1071  
Epoch 20/50  
721/721 [=====] - 0s 43us/step - loss: 504.5412  
Epoch 21/50  
721/721 [=====] - 0s 43us/step - loss: 486.6671  
Epoch 22/50  
721/721 [=====] - 0s 43us/step - loss: 469.2716  
Epoch 23/50  
721/721 [=====] - 0s 43us/step - loss: 452.6162  
Epoch 24/50  
721/721 [=====] - 0s 36us/step - loss: 437.0929  
Epoch 25/50  
721/721 [=====] - 0s 52us/step - loss: 422.7404  
Epoch 26/50  
721/721 [=====] - 0s 43us/step - loss: 409.6752  
Epoch 27/50  
721/721 [=====] - 0s 43us/step - loss: 398.7989  
Epoch 28/50  
721/721 [=====] - 0s 43us/step - loss: 389.5544

Epoch 29/50  
721/721 [=====] - 0s 43us/step - loss: 382.1367  
Epoch 30/50  
721/721 [=====] - 0s 65us/step - loss: 373.5689  
Epoch 31/50  
721/721 [=====] - 0s 43us/step - loss: 366.9320  
Epoch 32/50  
721/721 [=====] - 0s 43us/step - loss: 360.2723  
Epoch 33/50  
721/721 [=====] - 0s 53us/step - loss: 354.4458  
Epoch 34/50  
721/721 [=====] - 0s 43us/step - loss: 348.3253  
Epoch 35/50  
721/721 [=====] - 0s 65us/step - loss: 342.8960  
Epoch 36/50  
721/721 [=====] - 0s 43us/step - loss: 337.4732  
Epoch 37/50  
721/721 [=====] - 0s 43us/step - loss: 332.8004  
Epoch 38/50  
721/721 [=====] - 0s 43us/step - loss: 327.4309  
Epoch 39/50  
721/721 [=====] - 0s 65us/step - loss: 323.3415  
Epoch 40/50  
721/721 [=====] - 0s 36us/step - loss: 318.3561  
Epoch 41/50  
721/721 [=====] - 0s 65us/step - loss: 313.8006  
Epoch 42/50  
721/721 [=====] - 0s 43us/step - loss: 309.6795  
Epoch 43/50  
721/721 [=====] - 0s 65us/step - loss: 305.4950  
Epoch 44/50  
721/721 [=====] - 0s 43us/step - loss: 302.3215  
Epoch 45/50  
721/721 [=====] - 0s 43us/step - loss: 298.4695  
Epoch 46/50  
721/721 [=====] - 0s 65us/step - loss: 293.7144  
Epoch 47/50  
721/721 [=====] - 0s 65us/step - loss: 290.4303  
Epoch 48/50  
721/721 [=====] - 0s 87us/step - loss: 286.5448  
Epoch 49/50  
721/721 [=====] - 0s 43us/step - loss: 283.2247  
Epoch 50/50  
721/721 [=====] - 0s 43us/step - loss: 279.8400  
Epoch 1/50  
721/721 [=====] - 1s 2ms/step - loss: 970.4872  
Epoch 2/50  
721/721 [=====] - 0s 65us/step - loss: 539.4554

Epoch 3/50  
721/721 [=====] - 0s 65us/step - loss: 465.0423  
Epoch 4/50  
721/721 [=====] - 0s 65us/step - loss: 425.3012  
Epoch 5/50  
721/721 [=====] - 0s 65us/step - loss: 399.9309  
Epoch 6/50  
721/721 [=====] - 0s 65us/step - loss: 380.9869  
Epoch 7/50  
721/721 [=====] - 0s 43us/step - loss: 362.6303  
Epoch 8/50  
721/721 [=====] - 0s 43us/step - loss: 350.2711  
Epoch 9/50  
721/721 [=====] - 0s 43us/step - loss: 339.5915  
Epoch 10/50  
721/721 [=====] - 0s 43us/step - loss: 328.9170  
Epoch 11/50  
721/721 [=====] - 0s 65us/step - loss: 320.7615  
Epoch 12/50  
721/721 [=====] - 0s 65us/step - loss: 311.6093  
Epoch 13/50  
721/721 [=====] - 0s 65us/step - loss: 303.7360  
Epoch 14/50  
721/721 [=====] - 0s 87us/step - loss: 295.1513  
Epoch 15/50  
721/721 [=====] - 0s 65us/step - loss: 288.2048  
Epoch 16/50  
721/721 [=====] - 0s 87us/step - loss: 281.2006  
Epoch 17/50  
721/721 [=====] - 0s 65us/step - loss: 276.0726  
Epoch 18/50  
721/721 [=====] - 0s 65us/step - loss: 268.9546  
Epoch 19/50  
721/721 [=====] - 0s 43us/step - loss: 263.2390  
Epoch 20/50  
721/721 [=====] - 0s 65us/step - loss: 256.8442  
Epoch 21/50  
721/721 [=====] - 0s 65us/step - loss: 250.1052  
Epoch 22/50  
721/721 [=====] - 0s 87us/step - loss: 243.5672  
Epoch 23/50  
721/721 [=====] - 0s 65us/step - loss: 237.6384  
Epoch 24/50  
721/721 [=====] - 0s 65us/step - loss: 232.5728  
Epoch 25/50  
721/721 [=====] - 0s 65us/step - loss: 226.5217  
Epoch 26/50  
721/721 [=====] - 0s 65us/step - loss: 223.1091

Epoch 27/50  
721/721 [=====] - 0s 65us/step - loss: 217.9353  
Epoch 28/50  
721/721 [=====] - 0s 65us/step - loss: 214.5572  
Epoch 29/50  
721/721 [=====] - 0s 87us/step - loss: 210.0237  
Epoch 30/50  
721/721 [=====] - 0s 87us/step - loss: 206.8608  
Epoch 31/50  
721/721 [=====] - 0s 65us/step - loss: 204.1655  
Epoch 32/50  
721/721 [=====] - 0s 87us/step - loss: 200.9908  
Epoch 33/50  
721/721 [=====] - 0s 43us/step - loss: 198.9672  
Epoch 34/50  
721/721 [=====] - 0s 43us/step - loss: 195.3935  
Epoch 35/50  
721/721 [=====] - 0s 65us/step - loss: 192.2513  
Epoch 36/50  
721/721 [=====] - 0s 65us/step - loss: 190.3739  
Epoch 37/50  
721/721 [=====] - 0s 43us/step - loss: 188.9416  
Epoch 38/50  
721/721 [=====] - 0s 43us/step - loss: 185.6654  
Epoch 39/50  
721/721 [=====] - 0s 43us/step - loss: 183.2496  
Epoch 40/50  
721/721 [=====] - 0s 65us/step - loss: 181.3579  
Epoch 41/50  
721/721 [=====] - 0s 65us/step - loss: 179.5356  
Epoch 42/50  
721/721 [=====] - 0s 65us/step - loss: 177.2674  
Epoch 43/50  
721/721 [=====] - 0s 65us/step - loss: 176.6172  
Epoch 44/50  
721/721 [=====] - 0s 43us/step - loss: 174.5990  
Epoch 45/50  
721/721 [=====] - 0s 43us/step - loss: 172.3917  
Epoch 46/50  
721/721 [=====] - 0s 65us/step - loss: 172.0097  
Epoch 47/50  
721/721 [=====] - 0s 65us/step - loss: 169.2743  
Epoch 48/50  
721/721 [=====] - 0s 65us/step - loss: 168.2109  
Epoch 49/50  
721/721 [=====] - 0s 43us/step - loss: 165.9468  
Epoch 50/50  
721/721 [=====] - 0s 87us/step - loss: 163.9469



Epoch 1/50  
721/721 [=====] - 1s 2ms/step - loss: 897.4370  
Epoch 2/50  
721/721 [=====] - 0s 65us/step - loss: 656.0853  
Epoch 3/50  
721/721 [=====] - 0s 65us/step - loss: 460.7454  
Epoch 4/50  
721/721 [=====] - 0s 65us/step - loss: 338.0586  
Epoch 5/50  
721/721 [=====] - 0s 65us/step - loss: 255.4737  
Epoch 6/50  
721/721 [=====] - 0s 65us/step - loss: 214.9732  
Epoch 7/50  
721/721 [=====] - 0s 43us/step - loss: 189.3810  
Epoch 8/50  
721/721 [=====] - 0s 65us/step - loss: 169.2533  
Epoch 9/50  
721/721 [=====] - 0s 65us/step - loss: 157.4045  
Epoch 10/50  
721/721 [=====] - 0s 43us/step - loss: 149.6467  
Epoch 11/50  
721/721 [=====] - 0s 65us/step - loss: 143.9492  
Epoch 12/50  
721/721 [=====] - 0s 60us/step - loss: 139.0659  
Epoch 13/50  
721/721 [=====] - 0s 65us/step - loss: 136.0569  
Epoch 14/50  
721/721 [=====] - 0s 65us/step - loss: 131.4044  
Epoch 15/50  
721/721 [=====] - 0s 65us/step - loss: 129.4392  
Epoch 16/50  
721/721 [=====] - 0s 65us/step - loss: 127.6586  
Epoch 17/50  
721/721 [=====] - 0s 65us/step - loss: 125.3337  
Epoch 18/50  
721/721 [=====] - 0s 43us/step - loss: 125.9658  
Epoch 19/50  
721/721 [=====] - 0s 65us/step - loss: 123.7373  
Epoch 20/50  
721/721 [=====] - 0s 43us/step - loss: 127.3193  
Epoch 21/50  
721/721 [=====] - 0s 65us/step - loss: 127.4054  
Epoch 22/50  
721/721 [=====] - 0s 65us/step - loss: 122.7393  
Epoch 23/50  
721/721 [=====] - 0s 65us/step - loss: 125.1627  
Epoch 24/50  
721/721 [=====] - 0s 65us/step - loss: 122.9192

Epoch 25/50  
721/721 [=====] - 0s 65us/step - loss: 119.5184  
Epoch 26/50  
721/721 [=====] - 0s 65us/step - loss: 117.7571  
Epoch 27/50  
721/721 [=====] - 0s 43us/step - loss: 123.3931  
Epoch 28/50  
721/721 [=====] - 0s 87us/step - loss: 121.9858  
Epoch 29/50  
721/721 [=====] - 0s 65us/step - loss: 127.2428  
Epoch 30/50  
721/721 [=====] - 0s 65us/step - loss: 123.4357  
Epoch 31/50  
721/721 [=====] - 0s 65us/step - loss: 116.2695  
Epoch 32/50  
721/721 [=====] - 0s 65us/step - loss: 119.6164  
Epoch 33/50  
721/721 [=====] - 0s 43us/step - loss: 118.3541  
Epoch 34/50  
721/721 [=====] - 0s 43us/step - loss: 117.1478  
Epoch 35/50  
721/721 [=====] - 0s 65us/step - loss: 119.1880  
Epoch 36/50  
721/721 [=====] - 0s 65us/step - loss: 115.4052  
Epoch 37/50  
721/721 [=====] - 0s 65us/step - loss: 115.9802  
Epoch 38/50  
721/721 [=====] - 0s 65us/step - loss: 116.3884  
Epoch 39/50  
721/721 [=====] - 0s 43us/step - loss: 117.0591  
Epoch 40/50  
721/721 [=====] - 0s 65us/step - loss: 117.8229  
Epoch 41/50  
721/721 [=====] - 0s 43us/step - loss: 117.4884  
Epoch 42/50  
721/721 [=====] - 0s 65us/step - loss: 122.0039  
Epoch 43/50  
721/721 [=====] - 0s 65us/step - loss: 114.3441  
Epoch 44/50  
721/721 [=====] - 0s 65us/step - loss: 114.1784  
Epoch 45/50  
721/721 [=====] - 0s 43us/step - loss: 113.6830  
Epoch 46/50  
721/721 [=====] - 0s 65us/step - loss: 114.9038  
Epoch 47/50  
721/721 [=====] - 0s 43us/step - loss: 117.3953  
Epoch 48/50  
721/721 [=====] - 0s 65us/step - loss: 115.0841

Epoch 49/50  
721/721 [=====] - 0s 65us/step - loss: 118.2778  
Epoch 50/50  
721/721 [=====] - 0s 65us/step - loss: 114.3161  
Epoch 1/50  
721/721 [=====] - 1s 2ms/step - loss: 11599.1815  
Epoch 2/50  
721/721 [=====] - 0s 65us/step - loss: 7681.4989  
Epoch 3/50  
721/721 [=====] - 0s 65us/step - loss: 6071.3137  
Epoch 4/50  
721/721 [=====] - 0s 43us/step - loss: 4822.2798  
Epoch 5/50  
721/721 [=====] - 0s 87us/step - loss: 3833.2703  
Epoch 6/50  
721/721 [=====] - 0s 43us/step - loss: 3145.0898  
Epoch 7/50  
721/721 [=====] - 0s 43us/step - loss: 2548.4518  
Epoch 8/50  
721/721 [=====] - 0s 65us/step - loss: 2093.7215  
Epoch 9/50  
721/721 [=====] - 0s 65us/step - loss: 1738.6934  
Epoch 10/50  
721/721 [=====] - 0s 65us/step - loss: 1475.8842  
Epoch 11/50  
721/721 [=====] - 0s 65us/step - loss: 1271.6595  
Epoch 12/50  
721/721 [=====] - 0s 65us/step - loss: 1126.6232  
Epoch 13/50  
721/721 [=====] - 0s 65us/step - loss: 1000.6564  
Epoch 14/50  
721/721 [=====] - 0s 65us/step - loss: 893.4669  
Epoch 15/50  
721/721 [=====] - 0s 43us/step - loss: 810.9932  
Epoch 16/50  
721/721 [=====] - ETA: 0s - loss: 461.554 - 0s  
65us/step - loss: 733.2510  
Epoch 17/50  
721/721 [=====] - 0s 43us/step - loss: 669.1264  
Epoch 18/50  
721/721 [=====] - 0s 65us/step - loss: 615.1943  
Epoch 19/50  
721/721 [=====] - 0s 65us/step - loss: 563.3108  
Epoch 20/50  
721/721 [=====] - 0s 65us/step - loss: 516.7188  
Epoch 21/50  
721/721 [=====] - 0s 43us/step - loss: 479.2993  
Epoch 22/50

721/721 [=====] - 0s 65us/step - loss: 442.4755  
 Epoch 23/50  
 721/721 [=====] - 0s 43us/step - loss: 411.8854  
 Epoch 24/50  
 721/721 [=====] - 0s 65us/step - loss: 386.9821  
 Epoch 25/50  
 721/721 [=====] - 0s 65us/step - loss: 357.8962  
 Epoch 26/50  
 721/721 [=====] - 0s 65us/step - loss: 337.0786  
 Epoch 27/50  
 721/721 [=====] - 0s 43us/step - loss: 315.7367  
 Epoch 28/50  
 721/721 [=====] - 0s 65us/step - loss: 303.3049  
 Epoch 29/50  
 721/721 [=====] - 0s 43us/step - loss: 281.6982  
 Epoch 30/50  
 721/721 [=====] - 0s 65us/step - loss: 267.0168  
 Epoch 31/50  
 721/721 [=====] - 0s 65us/step - loss: 255.0266  
 Epoch 32/50  
 721/721 [=====] - 0s 65us/step - loss: 239.2965  
 Epoch 33/50  
 721/721 [=====] - 0s 65us/step - loss: 228.2863  
 Epoch 34/50  
 721/721 [=====] - 0s 65us/step - loss: 215.1177  
 Epoch 35/50  
 721/721 [=====] - 0s 43us/step - loss: 205.7160  
 Epoch 36/50  
 721/721 [=====] - 0s 43us/step - loss: 195.7074  
 Epoch 37/50  
 721/721 [=====] - 0s 65us/step - loss: 188.8894  
 Epoch 38/50  
 721/721 [=====] - 0s 65us/step - loss: 179.2151  
 Epoch 39/50  
 721/721 [=====] - 0s 65us/step - loss: 173.3594  
 Epoch 40/50  
 721/721 [=====] - 0s 43us/step - loss: 164.8876  
 Epoch 41/50  
 721/721 [=====] - 0s 43us/step - loss: 160.3802  
 Epoch 42/50  
 721/721 [=====] - 0s 65us/step - loss: 157.5146  
 Epoch 43/50  
 721/721 [=====] - 0s 65us/step - loss: 151.0677  
 Epoch 44/50  
 721/721 [=====] - 0s 65us/step - loss: 146.7335  
 Epoch 45/50  
 721/721 [=====] - 0s 65us/step - loss: 142.0333  
 Epoch 46/50

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721/721 [=====] - 0s 65us/step - loss: 137.7991
Epoch 47/50
721/721 [=====] - 0s 43us/step - loss: 133.7131
Epoch 48/50
721/721 [=====] - 0s 43us/step - loss: 130.8690
Epoch 49/50
721/721 [=====] - 0s 87us/step - loss: 134.0869
Epoch 50/50
721/721 [=====] - 0s 65us/step - loss: 130.0703
Epoch 1/50
721/721 [=====] - 1s 2ms/step - loss: 338092.9856
Epoch 2/50
721/721 [=====] - 0s 65us/step - loss: 184225.4692
Epoch 3/50
721/721 [=====] - 0s 65us/step - loss: 83650.0435
Epoch 4/50
721/721 [=====] - 0s 65us/step - loss: 30639.3756
Epoch 5/50
721/721 [=====] - 0s 65us/step - loss: 13038.3355
Epoch 6/50
721/721 [=====] - 0s 43us/step - loss: 9539.2562
Epoch 7/50
721/721 [=====] - 0s 65us/step - loss: 8801.9558
Epoch 8/50
721/721 [=====] - 0s 65us/step - loss: 8353.4049
Epoch 9/50
721/721 [=====] - 0s 43us/step - loss: 7909.0280
Epoch 10/50
721/721 [=====] - 0s 43us/step - loss: 7469.5490
Epoch 11/50
721/721 [=====] - 0s 65us/step - loss: 7050.5367
Epoch 12/50
721/721 [=====] - 0s 65us/step - loss: 6647.6577
Epoch 13/50
721/721 [=====] - 0s 65us/step - loss: 6259.4966
Epoch 14/50
721/721 [=====] - 0s 65us/step - loss: 5882.9789
Epoch 15/50
721/721 [=====] - 0s 65us/step - loss: 5530.9635
Epoch 16/50
721/721 [=====] - 0s 65us/step - loss: 5183.6015
Epoch 17/50
721/721 [=====] - 0s 65us/step - loss: 4854.0186
Epoch 18/50
721/721 [=====] - 0s 65us/step - loss: 4544.0071
Epoch 19/50
721/721 [=====] - 0s 65us/step - loss: 4259.1086
Epoch 20/50

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721/721 [=====] - 0s 43us/step - loss: 3979.2392  
 Epoch 21/50  
 721/721 [=====] - 0s 43us/step - loss: 3717.3949  
 Epoch 22/50  
 721/721 [=====] - 0s 65us/step - loss: 3459.6269  
 Epoch 23/50  
 721/721 [=====] - 0s 65us/step - loss: 3200.2188  
 Epoch 24/50  
 721/721 [=====] - 0s 65us/step - loss: 2971.1016  
 Epoch 25/50  
 721/721 [=====] - 0s 65us/step - loss: 2720.8407  
 Epoch 26/50  
 721/721 [=====] - 0s 65us/step - loss: 2486.4522  
 Epoch 27/50  
 721/721 [=====] - 0s 43us/step - loss: 2272.9580  
 Epoch 28/50  
 721/721 [=====] - 0s 87us/step - loss: 2086.7127  
 Epoch 29/50  
 721/721 [=====] - 0s 65us/step - loss: 1913.2542  
 Epoch 30/50  
 721/721 [=====] - 0s 43us/step - loss: 1764.4052  
 Epoch 31/50  
 721/721 [=====] - 0s 65us/step - loss: 1633.4185  
 Epoch 32/50  
 721/721 [=====] - 0s 43us/step - loss: 1525.5206  
 Epoch 33/50  
 721/721 [=====] - 0s 65us/step - loss: 1416.4843  
 Epoch 34/50  
 721/721 [=====] - 0s 65us/step - loss: 1325.8199  
 Epoch 35/50  
 721/721 [=====] - 0s 65us/step - loss: 1244.4844  
 Epoch 36/50  
 721/721 [=====] - 0s 65us/step - loss: 1175.4666  
 Epoch 37/50  
 721/721 [=====] - 0s 65us/step - loss: 1111.9067  
 Epoch 38/50  
 721/721 [=====] - 0s 50us/step - loss: 1052.9990  
 Epoch 39/50  
 721/721 [=====] - 0s 65us/step - loss: 1004.1251  
 Epoch 40/50  
 721/721 [=====] - 0s 65us/step - loss: 956.0101  
 Epoch 41/50  
 721/721 [=====] - 0s 65us/step - loss: 915.2189  
 Epoch 42/50  
 721/721 [=====] - 0s 65us/step - loss: 878.6678  
 Epoch 43/50  
 721/721 [=====] - 0s 65us/step - loss: 844.2045  
 Epoch 44/50

```

721/721 [=====] - 0s 65us/step - loss: 815.0397
Epoch 45/50
721/721 [=====] - 0s 43us/step - loss: 786.8284
Epoch 46/50
721/721 [=====] - 0s 43us/step - loss: 761.3272
Epoch 47/50
721/721 [=====] - 0s 65us/step - loss: 738.3069
Epoch 48/50
721/721 [=====] - 0s 65us/step - loss: 717.5090
Epoch 49/50
721/721 [=====] - 0s 65us/step - loss: 697.6342
Epoch 50/50
721/721 [=====] - 0s 65us/step - loss: 679.2310
Epoch 1/50
721/721 [=====] - 1s 2ms/step - loss: 45454.0994
Epoch 2/50
721/721 [=====] - 0s 65us/step - loss: 16989.6044
Epoch 3/50
721/721 [=====] - 0s 65us/step - loss: 3399.8526
Epoch 4/50
721/721 [=====] - 0s 65us/step - loss: 1724.9393
Epoch 5/50
721/721 [=====] - 0s 65us/step - loss: 1623.1824
Epoch 6/50
721/721 [=====] - 0s 65us/step - loss: 1514.1644
Epoch 7/50
721/721 [=====] - 0s 65us/step - loss: 1422.6900
Epoch 8/50
721/721 [=====] - 0s 65us/step - loss: 1335.5682
Epoch 9/50
721/721 [=====] - 0s 65us/step - loss: 1254.6240
Epoch 10/50
721/721 [=====] - 0s 65us/step - loss: 1179.7459
Epoch 11/50
721/721 [=====] - 0s 65us/step - loss: 1113.6081
Epoch 12/50
721/721 [=====] - 0s 43us/step - loss: 1053.0445
Epoch 13/50
721/721 [=====] - 0s 43us/step - loss: 997.6481
Epoch 14/50
721/721 [=====] - 0s 65us/step - loss: 945.0038
Epoch 15/50
721/721 [=====] - 0s 65us/step - loss: 900.4990
Epoch 16/50
721/721 [=====] - 0s 65us/step - loss: 854.0552
Epoch 17/50
721/721 [=====] - 0s 65us/step - loss: 810.1143
Epoch 18/50

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721/721 [=====] - 0s 65us/step - loss: 767.3073
Epoch 19/50
721/721 [=====] - 0s 65us/step - loss: 727.1327
Epoch 20/50
721/721 [=====] - 0s 65us/step - loss: 687.0317
Epoch 21/50
721/721 [=====] - 0s 65us/step - loss: 650.4817
Epoch 22/50
721/721 [=====] - 0s 65us/step - loss: 616.1663
Epoch 23/50
721/721 [=====] - 0s 65us/step - loss: 584.4032
Epoch 24/50
721/721 [=====] - 0s 65us/step - loss: 554.0212
Epoch 25/50
721/721 [=====] - 0s 65us/step - loss: 523.3056
Epoch 26/50
721/721 [=====] - 0s 65us/step - loss: 496.6092
Epoch 27/50
721/721 [=====] - 0s 65us/step - loss: 478.1758
Epoch 28/50
721/721 [=====] - 0s 65us/step - loss: 456.3603
Epoch 29/50
721/721 [=====] - 0s 65us/step - loss: 438.4196
Epoch 30/50
721/721 [=====] - 0s 65us/step - loss: 421.7315
Epoch 31/50
721/721 [=====] - 0s 65us/step - loss: 405.6423
Epoch 32/50
721/721 [=====] - 0s 65us/step - loss: 391.6479
Epoch 33/50
721/721 [=====] - 0s 65us/step - loss: 377.3160
Epoch 34/50
721/721 [=====] - 0s 65us/step - loss: 365.3212
Epoch 35/50
721/721 [=====] - 0s 65us/step - loss: 351.5951
Epoch 36/50
721/721 [=====] - 0s 65us/step - loss: 340.2550
Epoch 37/50
721/721 [=====] - 0s 65us/step - loss: 328.3982
Epoch 38/50
721/721 [=====] - 0s 65us/step - loss: 319.0115
Epoch 39/50
721/721 [=====] - 0s 65us/step - loss: 309.8160
Epoch 40/50
721/721 [=====] - 0s 43us/step - loss: 301.4074
Epoch 41/50
721/721 [=====] - 0s 43us/step - loss: 293.3925
Epoch 42/50

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721/721 [=====] - 0s 87us/step - loss: 286.5043
Epoch 43/50
721/721 [=====] - 0s 65us/step - loss: 279.0128
Epoch 44/50
721/721 [=====] - 0s 65us/step - loss: 272.5928
Epoch 45/50
721/721 [=====] - 0s 65us/step - loss: 266.1088
Epoch 46/50
721/721 [=====] - 0s 43us/step - loss: 260.2497
Epoch 47/50
721/721 [=====] - 0s 43us/step - loss: 254.5750
Epoch 48/50
721/721 [=====] - 0s 87us/step - loss: 248.3540
Epoch 49/50
721/721 [=====] - 0s 65us/step - loss: 243.5027
Epoch 50/50
721/721 [=====] - 0s 43us/step - loss: 237.7071
Epoch 1/50
721/721 [=====] - 1s 2ms/step - loss: 3593.3058
Epoch 2/50
721/721 [=====] - 0s 65us/step - loss: 2072.9055
Epoch 3/50
721/721 [=====] - 0s 65us/step - loss: 1869.9923
Epoch 4/50
721/721 [=====] - 0s 65us/step - loss: 1721.1840
Epoch 5/50
721/721 [=====] - 0s 65us/step - loss: 1609.3473
Epoch 6/50
721/721 [=====] - 0s 43us/step - loss: 1501.2244
Epoch 7/50
721/721 [=====] - 0s 43us/step - loss: 1392.7150
Epoch 8/50
721/721 [=====] - 0s 87us/step - loss: 1265.6245
Epoch 9/50
721/721 [=====] - 0s 65us/step - loss: 1126.3381
Epoch 10/50
721/721 [=====] - 0s 65us/step - loss: 993.0731
Epoch 11/50
721/721 [=====] - 0s 65us/step - loss: 884.8769
Epoch 12/50
721/721 [=====] - 0s 65us/step - loss: 806.0407
Epoch 13/50
721/721 [=====] - 0s 65us/step - loss: 738.4462
Epoch 14/50
721/721 [=====] - 0s 65us/step - loss: 678.5491
Epoch 15/50
721/721 [=====] - 0s 65us/step - loss: 634.4465
Epoch 16/50

```

721/721 [=====] - 0s 65us/step - loss: 579.8287  
 Epoch 17/50  
 721/721 [=====] - 0s 65us/step - loss: 543.9791  
 Epoch 18/50  
 721/721 [=====] - 0s 65us/step - loss: 508.3808  
 Epoch 19/50  
 721/721 [=====] - 0s 65us/step - loss: 471.3278  
 Epoch 20/50  
 721/721 [=====] - 0s 65us/step - loss: 442.2339  
 Epoch 21/50  
 721/721 [=====] - 0s 65us/step - loss: 416.2766  
 Epoch 22/50  
 721/721 [=====] - 0s 65us/step - loss: 389.6469  
 Epoch 23/50  
 721/721 [=====] - 0s 65us/step - loss: 364.5918  
 Epoch 24/50  
 721/721 [=====] - 0s 65us/step - loss: 347.4589  
 Epoch 25/50  
 721/721 [=====] - 0s 65us/step - loss: 326.4138  
 Epoch 26/50  
 721/721 [=====] - 0s 65us/step - loss: 306.6785  
 Epoch 27/50  
 721/721 [=====] - 0s 65us/step - loss: 291.7276  
 Epoch 28/50  
 721/721 [=====] - 0s 65us/step - loss: 276.1199  
 Epoch 29/50  
 721/721 [=====] - 0s 65us/step - loss: 262.7482  
 Epoch 30/50  
 721/721 [=====] - 0s 65us/step - loss: 250.7586  
 Epoch 31/50  
 721/721 [=====] - 0s 65us/step - loss: 238.7816  
 Epoch 32/50  
 721/721 [=====] - 0s 65us/step - loss: 226.7990  
 Epoch 33/50  
 721/721 [=====] - 0s 65us/step - loss: 218.7228  
 Epoch 34/50  
 721/721 [=====] - 0s 65us/step - loss: 210.8466  
 Epoch 35/50  
 721/721 [=====] - 0s 65us/step - loss: 200.8460  
 Epoch 36/50  
 721/721 [=====] - 0s 65us/step - loss: 194.2205  
 Epoch 37/50  
 721/721 [=====] - 0s 65us/step - loss: 186.8918  
 Epoch 38/50  
 721/721 [=====] - 0s 65us/step - loss: 184.3419  
 Epoch 39/50  
 721/721 [=====] - 0s 65us/step - loss: 175.8633  
 Epoch 40/50

```

721/721 [=====] - 0s 65us/step - loss: 168.9855
Epoch 41/50
721/721 [=====] - 0s 65us/step - loss: 165.8718
Epoch 42/50
721/721 [=====] - 0s 65us/step - loss: 160.2497
Epoch 43/50
721/721 [=====] - 0s 65us/step - loss: 159.4621
Epoch 44/50
721/721 [=====] - 0s 65us/step - loss: 157.5613
Epoch 45/50
721/721 [=====] - 0s 65us/step - loss: 152.2727
Epoch 46/50
721/721 [=====] - 0s 65us/step - loss: 149.1433
Epoch 47/50
721/721 [=====] - 0s 43us/step - loss: 143.9561
Epoch 48/50
721/721 [=====] - 0s 65us/step - loss: 143.0207
Epoch 49/50
721/721 [=====] - 0s 65us/step - loss: 138.9463
Epoch 50/50
721/721 [=====] - 0s 43us/step - loss: 139.1100
Epoch 1/50
721/721 [=====] - 1s 2ms/step - loss: 224302.6824
Epoch 2/50
721/721 [=====] - 0s 65us/step - loss: 75419.7183
Epoch 3/50
721/721 [=====] - 0s 65us/step - loss: 21340.8047
Epoch 4/50
721/721 [=====] - 0s 65us/step - loss: 12095.4924
Epoch 5/50
721/721 [=====] - 0s 65us/step - loss: 11125.6262
Epoch 6/50
721/721 [=====] - 0s 43us/step - loss: 10278.8398
Epoch 7/50
721/721 [=====] - 0s 87us/step - loss: 9491.2345
Epoch 8/50
721/721 [=====] - 0s 65us/step - loss: 8752.1122
Epoch 9/50
721/721 [=====] - 0s 65us/step - loss: 8053.6139
Epoch 10/50
721/721 [=====] - 0s 65us/step - loss: 7399.3092
Epoch 11/50
721/721 [=====] - 0s 65us/step - loss: 6784.6031
Epoch 12/50
721/721 [=====] - 0s 65us/step - loss: 6208.3453
Epoch 13/50
721/721 [=====] - 0s 65us/step - loss: 5678.7394
Epoch 14/50

```

721/721 [=====] - 0s 65us/step - loss: 5187.8232  
Epoch 15/50  
721/721 [=====] - 0s 65us/step - loss: 4741.8510  
Epoch 16/50  
721/721 [=====] - 0s 65us/step - loss: 4330.5794  
Epoch 17/50  
721/721 [=====] - 0s 65us/step - loss: 3949.5428  
Epoch 18/50  
721/721 [=====] - 0s 65us/step - loss: 3591.0125  
Epoch 19/50  
721/721 [=====] - 0s 65us/step - loss: 3285.0526  
Epoch 20/50  
721/721 [=====] - 0s 65us/step - loss: 2991.2687  
Epoch 21/50  
721/721 [=====] - 0s 65us/step - loss: 2736.1731  
Epoch 22/50  
721/721 [=====] - 0s 65us/step - loss: 2498.0347  
Epoch 23/50  
721/721 [=====] - 0s 65us/step - loss: 2285.8374  
Epoch 24/50  
721/721 [=====] - 0s 65us/step - loss: 2093.8717  
Epoch 25/50  
721/721 [=====] - 0s 65us/step - loss: 1918.9219  
Epoch 26/50  
721/721 [=====] - 0s 65us/step - loss: 1759.0531  
Epoch 27/50  
721/721 [=====] - 0s 65us/step - loss: 1618.6557  
Epoch 28/50  
721/721 [=====] - 0s 65us/step - loss: 1485.6044  
Epoch 29/50  
721/721 [=====] - 0s 65us/step - loss: 1369.0086  
Epoch 30/50  
721/721 [=====] - 0s 65us/step - loss: 1271.4799  
Epoch 31/50  
721/721 [=====] - 0s 65us/step - loss: 1165.3665  
Epoch 32/50  
721/721 [=====] - 0s 65us/step - loss: 1081.0010  
Epoch 33/50  
721/721 [=====] - 0s 65us/step - loss: 1002.3235  
Epoch 34/50  
721/721 [=====] - 0s 65us/step - loss: 932.1442  
Epoch 35/50  
721/721 [=====] - 0s 65us/step - loss: 868.9133  
Epoch 36/50  
721/721 [=====] - 0s 65us/step - loss: 810.9937  
Epoch 37/50  
721/721 [=====] - 0s 65us/step - loss: 763.2399  
Epoch 38/50

```

721/721 [=====] - 0s 65us/step - loss: 709.7493
Epoch 39/50
721/721 [=====] - 0s 65us/step - loss: 670.1807
Epoch 40/50
721/721 [=====] - 0s 65us/step - loss: 631.5689
Epoch 41/50
721/721 [=====] - 0s 65us/step - loss: 597.3738
Epoch 42/50
721/721 [=====] - 0s 43us/step - loss: 567.6699
Epoch 43/50
721/721 [=====] - 0s 87us/step - loss: 541.3056
Epoch 44/50
721/721 [=====] - 0s 65us/step - loss: 516.3663
Epoch 45/50
721/721 [=====] - 0s 65us/step - loss: 494.5705
Epoch 46/50
721/721 [=====] - 0s 66us/step - loss: 475.2811
Epoch 47/50
721/721 [=====] - 0s 65us/step - loss: 457.3137
Epoch 48/50
721/721 [=====] - 0s 65us/step - loss: 438.9773
Epoch 49/50
721/721 [=====] - 0s 65us/step - loss: 424.8489
Epoch 50/50
721/721 [=====] - 0s 65us/step - loss: 412.8826
Epoch 1/50
721/721 [=====] - 1s 2ms/step - loss: 64505.3068
Epoch 2/50
721/721 [=====] - 0s 65us/step - loss: 26996.9602
Epoch 3/50
721/721 [=====] - 0s 65us/step - loss: 11237.3225
Epoch 4/50
721/721 [=====] - 0s 65us/step - loss: 5268.6291
Epoch 5/50
721/721 [=====] - 0s 65us/step - loss: 3847.9877
Epoch 6/50
721/721 [=====] - 0s 43us/step - loss: 3554.5580
Epoch 7/50
721/721 [=====] - 0s 65us/step - loss: 3347.5197
Epoch 8/50
721/721 [=====] - 0s 65us/step - loss: 3180.6928
Epoch 9/50
721/721 [=====] - 0s 87us/step - loss: 3026.9217
Epoch 10/50
721/721 [=====] - 0s 65us/step - loss: 2889.6597
Epoch 11/50
721/721 [=====] - 0s 65us/step - loss: 2761.3925
Epoch 12/50

```

721/721 [=====] - 0s 65us/step - loss: 2643.1562  
Epoch 13/50  
721/721 [=====] - 0s 65us/step - loss: 2505.3008  
Epoch 14/50  
721/721 [=====] - 0s 65us/step - loss: 2359.0898  
Epoch 15/50  
721/721 [=====] - 0s 65us/step - loss: 2217.7589  
Epoch 16/50  
721/721 [=====] - 0s 65us/step - loss: 2079.9606  
Epoch 17/50  
721/721 [=====] - 0s 65us/step - loss: 1939.8683  
Epoch 18/50  
721/721 [=====] - 0s 65us/step - loss: 1780.1411  
Epoch 19/50  
721/721 [=====] - 0s 65us/step - loss: 1595.3481  
Epoch 20/50  
721/721 [=====] - 0s 65us/step - loss: 1404.9744  
Epoch 21/50  
721/721 [=====] - 0s 65us/step - loss: 1214.2710  
Epoch 22/50  
721/721 [=====] - 0s 65us/step - loss: 1040.7653  
Epoch 23/50  
721/721 [=====] - 0s 65us/step - loss: 898.5366  
Epoch 24/50  
721/721 [=====] - 0s 65us/step - loss: 790.6317  
Epoch 25/50  
721/721 [=====] - 0s 65us/step - loss: 698.0627  
Epoch 26/50  
721/721 [=====] - 0s 65us/step - loss: 625.9017  
Epoch 27/50  
721/721 [=====] - 0s 65us/step - loss: 563.8512  
Epoch 28/50  
721/721 [=====] - 0s 65us/step - loss: 509.4093  
Epoch 29/50  
721/721 [=====] - 0s 65us/step - loss: 472.7778  
Epoch 30/50  
721/721 [=====] - 0s 65us/step - loss: 417.1595  
Epoch 31/50  
721/721 [=====] - 0s 65us/step - loss: 385.8419  
Epoch 32/50  
721/721 [=====] - 0s 65us/step - loss: 353.5147  
Epoch 33/50  
721/721 [=====] - 0s 65us/step - loss: 327.2778  
Epoch 34/50  
721/721 [=====] - 0s 65us/step - loss: 300.3467  
Epoch 35/50  
721/721 [=====] - 0s 65us/step - loss: 278.0061  
Epoch 36/50

721/721 [=====] - 0s 65us/step - loss: 260.1677  
Epoch 37/50  
721/721 [=====] - 0s 65us/step - loss: 240.1558  
Epoch 38/50  
721/721 [=====] - 0s 65us/step - loss: 224.9272  
Epoch 39/50  
721/721 [=====] - 0s 65us/step - loss: 211.6767  
Epoch 40/50  
721/721 [=====] - 0s 65us/step - loss: 196.1636  
Epoch 41/50  
721/721 [=====] - 0s 65us/step - loss: 186.1216  
Epoch 42/50  
721/721 [=====] - 0s 65us/step - loss: 174.9550  
Epoch 43/50  
721/721 [=====] - 0s 65us/step - loss: 166.6718  
Epoch 44/50  
721/721 [=====] - 0s 65us/step - loss: 158.3591  
Epoch 45/50  
721/721 [=====] - 0s 65us/step - loss: 151.1054  
Epoch 46/50  
721/721 [=====] - 0s 65us/step - loss: 146.8739  
Epoch 47/50  
721/721 [=====] - 0s 65us/step - loss: 141.4391  
Epoch 48/50  
721/721 [=====] - 0s 65us/step - loss: 137.6490  
Epoch 49/50  
721/721 [=====] - 0s 65us/step - loss: 133.6796  
Epoch 50/50  
721/721 [=====] - 0s 65us/step - loss: 132.3857  
Epoch 1/50  
721/721 [=====] - 1s 2ms/step - loss: 31516.4917  
Epoch 2/50  
721/721 [=====] - 0s 65us/step - loss: 9997.0473  
Epoch 3/50  
721/721 [=====] - 0s 65us/step - loss: 4459.0948  
Epoch 4/50  
721/721 [=====] - 0s 65us/step - loss: 3762.0056  
Epoch 5/50  
721/721 [=====] - 0s 65us/step - loss: 3234.4353  
Epoch 6/50  
721/721 [=====] - 0s 65us/step - loss: 2777.3473  
Epoch 7/50  
721/721 [=====] - 0s 65us/step - loss: 2388.4541  
Epoch 8/50  
721/721 [=====] - 0s 65us/step - loss: 2048.4735  
Epoch 9/50  
721/721 [=====] - 0s 65us/step - loss: 1762.9729  
Epoch 10/50

721/721 [=====] - 0s 65us/step - loss: 1511.0782  
 Epoch 11/50  
 721/721 [=====] - 0s 65us/step - loss: 1304.3467  
 Epoch 12/50  
 721/721 [=====] - 0s 65us/step - loss: 1120.1637  
 Epoch 13/50  
 721/721 [=====] - 0s 43us/step - loss: 967.0763  
 Epoch 14/50  
 721/721 [=====] - 0s 43us/step - loss: 838.0893  
 Epoch 15/50  
 721/721 [=====] - 0s 43us/step - loss: 726.5449  
 Epoch 16/50  
 721/721 [=====] - 0s 65us/step - loss: 632.9090  
 Epoch 17/50  
 721/721 [=====] - 0s 65us/step - loss: 555.2080  
 Epoch 18/50  
 721/721 [=====] - 0s 65us/step - loss: 488.6661  
 Epoch 19/50  
 721/721 [=====] - 0s 65us/step - loss: 432.2901  
 Epoch 20/50  
 721/721 [=====] - 0s 65us/step - loss: 383.6172  
 Epoch 21/50  
 721/721 [=====] - 0s 65us/step - loss: 344.5414  
 Epoch 22/50  
 721/721 [=====] - 0s 87us/step - loss: 310.9160  
 Epoch 23/50  
 721/721 [=====] - 0s 65us/step - loss: 282.5138  
 Epoch 24/50  
 721/721 [=====] - 0s 43us/step - loss: 257.0512  
 Epoch 25/50  
 721/721 [=====] - 0s 65us/step - loss: 234.1971  
 Epoch 26/50  
 721/721 [=====] - 0s 43us/step - loss: 214.1129  
 Epoch 27/50  
 721/721 [=====] - 0s 65us/step - loss: 197.8623  
 Epoch 28/50  
 721/721 [=====] - 0s 87us/step - loss: 184.7076  
 Epoch 29/50  
 721/721 [=====] - 0s 65us/step - loss: 173.4114  
 Epoch 30/50  
 721/721 [=====] - 0s 65us/step - loss: 162.4964  
 Epoch 31/50  
 721/721 [=====] - 0s 43us/step - loss: 156.7593  
 Epoch 32/50  
 721/721 [=====] - 0s 65us/step - loss: 149.1139  
 Epoch 33/50  
 721/721 [=====] - 0s 65us/step - loss: 142.2390  
 Epoch 34/50



721/721 [=====] - 0s 65us/step - loss: 138.6191  
 Epoch 35/50  
 721/721 [=====] - 0s 75us/step - loss: 133.8854  
 Epoch 36/50  
 721/721 [=====] - 0s 48us/step - loss: 131.0355  
 Epoch 37/50  
 721/721 [=====] - 0s 65us/step - loss: 128.8849  
 Epoch 38/50  
 721/721 [=====] - 0s 43us/step - loss: 127.1308  
 Epoch 39/50  
 721/721 [=====] - 0s 65us/step - loss: 124.2662  
 Epoch 40/50  
 721/721 [=====] - 0s 87us/step - loss: 123.2613  
 Epoch 41/50  
 721/721 [=====] - 0s 65us/step - loss: 121.7463  
 Epoch 42/50  
 721/721 [=====] - 0s 65us/step - loss: 119.7230  
 Epoch 43/50  
 721/721 [=====] - 0s 65us/step - loss: 117.9222  
 Epoch 44/50  
 721/721 [=====] - 0s 65us/step - loss: 117.3844  
 Epoch 45/50  
 721/721 [=====] - 0s 65us/step - loss: 115.4309  
 Epoch 46/50  
 721/721 [=====] - 0s 65us/step - loss: 114.0548  
 Epoch 47/50  
 721/721 [=====] - 0s 65us/step - loss: 111.4740  
 Epoch 48/50  
 721/721 [=====] - 0s 65us/step - loss: 110.4425  
 Epoch 49/50  
 721/721 [=====] - 0s 65us/step - loss: 108.9610  
 Epoch 50/50  
 721/721 [=====] - 0s 65us/step - loss: 107.3119  
 Epoch 1/50  
 721/721 [=====] - 1s 2ms/step - loss: 946182.7134  
 Epoch 2/50  
 721/721 [=====] - 0s 65us/step - loss: 657451.2826  
 Epoch 3/50  
 721/721 [=====] - 0s 65us/step - loss: 457517.0375  
 Epoch 4/50  
 721/721 [=====] - 0s 65us/step - loss: 320688.1996  
 Epoch 5/50  
 721/721 [=====] - 0s 87us/step - loss: 225263.2223  
 Epoch 6/50  
 721/721 [=====] - 0s 65us/step - loss: 158493.1555  
 Epoch 7/50  
 721/721 [=====] - 0s 65us/step - loss: 111133.1770  
 Epoch 8/50

721/721 [=====] - 0s 65us/step - loss: 76846.4734  
 Epoch 9/50  
 721/721 [=====] - 0s 65us/step - loss: 51828.2370  
 Epoch 10/50  
 721/721 [=====] - 0s 65us/step - loss: 33918.2991  
 Epoch 11/50  
 721/721 [=====] - 0s 65us/step - loss: 21539.8360  
 Epoch 12/50  
 721/721 [=====] - 0s 65us/step - loss: 13295.6887  
 Epoch 13/50  
 721/721 [=====] - 0s 65us/step - loss: 8013.2595  
 Epoch 14/50  
 721/721 [=====] - 0s 43us/step - loss: 4794.9720  
 Epoch 15/50  
 721/721 [=====] - 0s 65us/step - loss: 2942.0478  
 Epoch 16/50  
 721/721 [=====] - 0s 65us/step - loss: 1909.4548  
 Epoch 17/50  
 721/721 [=====] - 0s 43us/step - loss: 1363.5555  
 Epoch 18/50  
 721/721 [=====] - 0s 43us/step - loss: 1087.4024  
 Epoch 19/50  
 721/721 [=====] - 0s 43us/step - loss: 952.5779  
 Epoch 20/50  
 721/721 [=====] - 0s 65us/step - loss: 881.9852  
 Epoch 21/50  
 721/721 [=====] - 0s 65us/step - loss: 849.3503  
 Epoch 22/50  
 721/721 [=====] - 0s 65us/step - loss: 830.7858  
 Epoch 23/50  
 721/721 [=====] - 0s 65us/step - loss: 818.5876  
 Epoch 24/50  
 721/721 [=====] - 0s 65us/step - loss: 809.2022  
 Epoch 25/50  
 721/721 [=====] - 0s 65us/step - loss: 800.7020  
 Epoch 26/50  
 721/721 [=====] - 0s 65us/step - loss: 793.2336  
 Epoch 27/50  
 721/721 [=====] - 0s 43us/step - loss: 784.9036  
 Epoch 28/50  
 721/721 [=====] - 0s 43us/step - loss: 777.5609  
 Epoch 29/50  
 721/721 [=====] - 0s 65us/step - loss: 769.2487  
 Epoch 30/50  
 721/721 [=====] - 0s 43us/step - loss: 761.4542  
 Epoch 31/50  
 721/721 [=====] - 0s 87us/step - loss: 753.8252  
 Epoch 32/50

```

721/721 [=====] - 0s 87us/step - loss: 745.7294
Epoch 33/50
721/721 [=====] - 0s 65us/step - loss: 738.2687
Epoch 34/50
721/721 [=====] - 0s 65us/step - loss: 730.4792
Epoch 35/50
721/721 [=====] - 0s 43us/step - loss: 723.0448
Epoch 36/50
721/721 [=====] - 0s 65us/step - loss: 715.0816
Epoch 37/50
721/721 [=====] - 0s 65us/step - loss: 707.9174
Epoch 38/50
721/721 [=====] - 0s 65us/step - loss: 700.0052
Epoch 39/50
721/721 [=====] - 0s 65us/step - loss: 692.5843
Epoch 40/50
721/721 [=====] - 0s 65us/step - loss: 685.1662
Epoch 41/50
721/721 [=====] - 0s 65us/step - loss: 677.5467
Epoch 42/50
721/721 [=====] - 0s 65us/step - loss: 670.4266
Epoch 43/50
721/721 [=====] - 0s 65us/step - loss: 663.1496
Epoch 44/50
721/721 [=====] - 0s 43us/step - loss: 655.5550
Epoch 45/50
721/721 [=====] - 0s 65us/step - loss: 648.3202
Epoch 46/50
721/721 [=====] - 0s 65us/step - loss: 641.3909
Epoch 47/50
721/721 [=====] - 0s 65us/step - loss: 633.9721
Epoch 48/50
721/721 [=====] - 0s 65us/step - loss: 626.9166
Epoch 49/50
721/721 [=====] - 0s 65us/step - loss: 619.9110
Epoch 50/50
721/721 [=====] - 0s 65us/step - loss: 613.4346
Epoch 1/50
721/721 [=====] - 1s 2ms/step - loss: 77404.1747
Epoch 2/50
721/721 [=====] - 0s 65us/step - loss: 22650.7836
Epoch 3/50
721/721 [=====] - 0s 65us/step - loss: 8956.2303
Epoch 4/50
721/721 [=====] - 0s 65us/step - loss: 7042.1649
Epoch 5/50
721/721 [=====] - 0s 65us/step - loss: 6570.4562
Epoch 6/50

```

721/721 [=====] - 0s 65us/step - loss: 6092.8292  
Epoch 7/50  
721/721 [=====] - 0s 65us/step - loss: 5643.4567  
Epoch 8/50  
721/721 [=====] - 0s 65us/step - loss: 5224.9244  
Epoch 9/50  
721/721 [=====] - 0s 65us/step - loss: 4821.3280  
Epoch 10/50  
721/721 [=====] - 0s 65us/step - loss: 4449.5358  
Epoch 11/50  
721/721 [=====] - 0s 65us/step - loss: 4107.7404  
Epoch 12/50  
721/721 [=====] - 0s 65us/step - loss: 3790.9571  
Epoch 13/50  
721/721 [=====] - 0s 65us/step - loss: 3481.0865  
Epoch 14/50  
721/721 [=====] - 0s 87us/step - loss: 3207.5742  
Epoch 15/50  
721/721 [=====] - 0s 65us/step - loss: 2948.8045  
Epoch 16/50  
721/721 [=====] - 0s 65us/step - loss: 2714.8450  
Epoch 17/50  
721/721 [=====] - 0s 65us/step - loss: 2474.3507  
Epoch 18/50  
721/721 [=====] - 0s 65us/step - loss: 2259.4074  
Epoch 19/50  
721/721 [=====] - 0s 65us/step - loss: 2060.0216  
Epoch 20/50  
721/721 [=====] - 0s 65us/step - loss: 1866.8854  
Epoch 21/50  
721/721 [=====] - 0s 87us/step - loss: 1695.8273  
Epoch 22/50  
721/721 [=====] - 0s 65us/step - loss: 1536.8225  
Epoch 23/50  
721/721 [=====] - 0s 65us/step - loss: 1391.7846  
Epoch 24/50  
721/721 [=====] - 0s 65us/step - loss: 1267.6210  
Epoch 25/50  
721/721 [=====] - 0s 65us/step - loss: 1149.6209  
Epoch 26/50  
721/721 [=====] - 0s 65us/step - loss: 1048.3108  
Epoch 27/50  
721/721 [=====] - 0s 65us/step - loss: 958.1107  
Epoch 28/50  
721/721 [=====] - 0s 65us/step - loss: 878.4702  
Epoch 29/50  
721/721 [=====] - 0s 65us/step - loss: 808.7430  
Epoch 30/50

```

721/721 [=====] - 0s 65us/step - loss: 745.0732
Epoch 31/50
721/721 [=====] - 0s 87us/step - loss: 690.6372
Epoch 32/50
721/721 [=====] - 0s 65us/step - loss: 634.8057
Epoch 33/50
721/721 [=====] - 0s 65us/step - loss: 586.1913
Epoch 34/50
721/721 [=====] - 0s 65us/step - loss: 540.6661
Epoch 35/50
721/721 [=====] - 0s 65us/step - loss: 493.9868
Epoch 36/50
721/721 [=====] - 0s 65us/step - loss: 450.8604
Epoch 37/50
721/721 [=====] - 0s 65us/step - loss: 410.7250
Epoch 38/50
721/721 [=====] - 0s 65us/step - loss: 376.8075
Epoch 39/50
721/721 [=====] - 0s 65us/step - loss: 346.1117
Epoch 40/50
721/721 [=====] - 0s 65us/step - loss: 322.9334
Epoch 41/50
721/721 [=====] - 0s 65us/step - loss: 299.3640
Epoch 42/50
721/721 [=====] - 0s 65us/step - loss: 280.1787
Epoch 43/50
721/721 [=====] - 0s 65us/step - loss: 262.4372
Epoch 44/50
721/721 [=====] - 0s 65us/step - loss: 246.9940
Epoch 45/50
721/721 [=====] - 0s 65us/step - loss: 233.1877
Epoch 46/50
721/721 [=====] - 0s 65us/step - loss: 220.0995
Epoch 47/50
721/721 [=====] - 0s 65us/step - loss: 209.6418
Epoch 48/50
721/721 [=====] - 0s 65us/step - loss: 199.3637
Epoch 49/50
721/721 [=====] - 0s 65us/step - loss: 190.1790
Epoch 50/50
721/721 [=====] - 0s 65us/step - loss: 181.9287

```

```
[44]: print("A list of 50 mean squared errors:", l)
```

```

A list of 50 mean squared errors: [510.915533185991, 1198.618117726843,
485.6367339647673, 1855.4465378055727, 103.2374736897105, 317.896103418164,
98.4043203463954, 139.5537849809597, 225.23368054582994, 93.91911265087072,

```

```
405.70291841820773, 295.4247439837862, 1086.1871863511026, 177.8376684941068,
303.31094166857025, 111.2252336171504, 107.90525807698526, 114.0171272939242,
179.52555530688218, 351.6169564366705, 695.5715224133343, 142.4115077028561,
618.4042519567078, 981.4378934835478, 126.33095971543938, 88.56260505688896,
69.38397956220565, 109.24139853925098, 548.0992314389456, 351.3429752062845,
181.00015100118787, 191.40313590273902, 94.21910121270484, 619.5009871724508,
100.92926504263991, 130.444033532146, 597.0612208528426, 228.26096255103937,
293.44790390945826, 136.72722748877604, 94.42796690862056, 125.78039443444901,
623.9154763531053, 214.76811063442094, 113.04375055694923, 330.5213935503825,
108.05139413008054, 111.80051353310381, 497.5005884449631, 159.43953365300166]
```

```
[45]: s = sum(l)
```

```
[46]: s.mean()
```

```
[46]: 16844.64442390301
```

```
[47]: import statistics
```

```
[48]: statistics.stdev(l)
```

```
[48]: 345.409030829459
```

Mean and the standard deviation of the mean squared errors are 16844.64 and 345.409.

## 0.0.7 B. Normalize the data

## 0.0.8 Train test split

```
[49]: X.shape
```

```
[49]: (1030, 8)
```

```
[50]: y.shape
```

```
[50]: (1030, 1)
```

```
[51]: X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3,
↳random_state=0)
```

```
[52]: X_train.head()
```

```
[52]:      Cement  Blast Furnace Slag  Fly Ash  Water  Superplasticizer  \
772    382.0          0.0      0.0  186.0          0.0
997    310.0      142.8      0.0  167.9          10.0
724    310.0          0.0      0.0  192.0          0.0
167    475.0      118.8      0.0  181.1          8.9
764    385.0          0.0      0.0  186.0          0.0

      Coarse Aggregate  Fine Aggregate  Age
772          1047.0          739.0     7
997           914.3          804.0    28
724          1012.0          830.0    90
167           852.1          781.5    91
```

```
764          966.0          763.0    3
```

```
[53]: X_test.head()
```

```
[53]:      Cement  Blast Furnace Slag  Fly Ash  Water  Superplasticizer  \
747    500.0          0.0      0.0  200.0          0.0
718    122.6          183.9      0.0  203.5          0.0
175    362.6          189.0      0.0  164.9         11.6
828    522.0           0.0      0.0  146.0          0.0
713    157.0          236.0      0.0  192.0          0.0

      Coarse Aggregate  Fine Aggregate  Age
747          1125.0          613.0     3
718           958.2          800.1     7
175           944.7          755.8    91
828           896.0          896.0    28
713           935.4          781.2     3
```

```
[54]: y_train.head()
```

```
[54]:      Strength
772     24.00
997     45.30
724     35.76
167     74.19
764     14.70
```

```
[55]: X_train.shape
```

```
[55]: (721, 8)
```

```
[56]: X_test.shape
```

```
[56]: (309, 8)
```

## 0.0.9 Standarisisation

StandardScaler from scikit-learn removes the mean and scales the data to unit variance.

```
[57]: scaler = StandardScaler()
```

```
[58]: X_train_scaled = scaler.fit_transform(X_train) # fit the scaler to the train
      ↪ set, and then transform it
      X_test_scaled = scaler.transform(X_test) # transform the test set
      y_train_scaled = scaler.fit_transform(y_train)
```

```
[59]: X_train_scaled
```

```
[59]: array([[ 0.97439458, -0.8704381 , -0.8293616 , ...,  0.97017264,
           -0.45169706, -0.60901288],
          [ 0.28796059,  0.7439307 , -0.8293616 , ..., -0.73327832,
           0.3565463 , -0.28406436],
          [ 0.28796059, -0.8704381 , -0.8293616 , ...,  0.52088264,
```

```

0.67984364, 0.67530744],
...,
[-1.2946511, -0.8704381, 1.85586008, ..., -0.36486052,
 0.85392682, -0.28406436],
[-0.38321931, 3.19261614, -0.8293616, ..., -0.38283212,
 -1.38055519, -0.28406436],
[-0.83702844, 2.38543174, -0.8293616, ..., -0.53430703,
 -0.73644741, 0.67530744]])

```

```
[60]: X_test_scaled
```

```

[60]: array([[ 2.09938362, -0.8704381, -0.8293616, ..., 1.97144751,
 -2.01844571, -0.67090783],
 [-1.49867454, 1.20857046, -0.8293616, ..., -0.16974029,
 0.3080517, -0.60901288],
 [ 0.78943876, 1.26622648, -0.8293616, ..., -0.34303786,
 -0.24279723, 0.69078118],
 ...,
 [-1.01817075, 0.44095392, -0.8293616, ..., -0.31608046,
 1.01308859, -0.60901288],
 [-0.47474384, -0.8704381, 0.98584826, ..., 0.74424395,
 -0.2079806, -0.5006967 ],
 [-0.02570161, -0.8704381, 0.66515607, ..., 0.03179837,
 1.24685744, -0.28406436]])

```

```
[61]: y_train_scaled
```

```

[61]: array([[-6.98142676e-01],
 [ 5.56356122e-01],
 [-5.51798779e-03],
 [ 2.25788055e+00],
 [-1.24588159e+00],
 [-6.03319058e-01],
 [ 1.53934133e+00],
 [ 1.30533290e-01],
 [ 1.07464671e+00],
 [ 2.94854964e-01],
 [ 2.34780374e-01],
 [-7.90021462e-01],
 [-5.86827994e-01],
 [ 4.16182078e-01],
 [-3.06479906e-01],
 [-5.68570031e-01],
 [-7.48793802e-01],
 [-5.29698237e-01],
 [-5.71514863e-01],
 [ 9.77467221e-01],
 [ 1.21698792e-01],
 [ 3.52573688e-01],

```



[ 7.73684787e-01],  
[-1.60868500e+00],  
[-6.10695436e-03],  
[ 7.50126124e-01],  
[-8.39494654e-01],  
[-4.15438722e-01],  
[-1.78674160e-01],  
[ 2.55884247e+00],  
[-1.42551639e+00],  
[ 1.82145632e+00],  
[ 1.48633434e+00],  
[ 7.54837857e-01],  
[ 2.55983170e-01],  
[-5.65036231e-01],  
[-1.31891344e+00],  
[ 7.00063965e-01],  
[-7.15811673e-01],  
[-4.72568479e-01],  
[-2.65252246e-01],  
[ 1.44098391e+00],  
[ 7.56604756e-01],  
[ 1.90607881e-01],  
[-1.61005163e-01],  
[ 8.69497640e-02],  
[ 8.74398071e-01],  
[-1.31243481e+00],  
[-1.27434068e-01],  
[ 1.03695284e+00],  
[-1.13986761e+00],  
[ 1.53168476e+00],  
[ 1.43921701e+00],  
[ 4.21482777e-01],  
[ 2.44104915e+00],  
[ 1.23661251e+00],  
[ 1.15710203e+00],  
[-1.22526776e+00],  
[-1.06094608e+00],  
[-9.47275536e-01],  
[-6.66338481e-01],  
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[-1.61869743e+00],  
[-1.50973861e+00],  
[-1.25177125e+00],  
[ 4.62121470e-01],  
[-1.65698026e+00],  
[-2.65252246e-01],  
[ 5.31030559e-01],  
[ 5.60478888e-01],

```

[-3.59486897e-01],
[-5.72103830e-01],
[ 1.13943303e+00],
[-3.90113159e-01],
[ 8.94422934e-01],
[ 1.77021623e+00],
[ 2.55884247e+00],
[-1.53800901e+00],
[ 1.12176403e+00],
[ 8.87166637e-02],
[ 9.34472661e-01],
[-8.90734745e-01],
[ 9.99258984e-01],
[-2.21079753e-01],
[ 2.10651614e+00],
[ 9.60644506e-04],
[-4.43897815e-02],
[ 6.11718980e-01],
[-2.36392884e-01],
[-1.44514099e-01],
[ 1.25781531e+00],
[ 4.76256668e-01],
[-1.65933612e+00],
[-1.04975572e+00],
[-2.34037018e-01],
[ 2.33503517e+00],
[-6.74584013e-01],
[-1.62870986e+00],
[ 6.37633509e-01],
[-1.91612555e+00],
[-8.73654715e-01],
[ 3.24892259e-01],
[-5.19096838e-01],
[ 5.04527063e-01],
[-8.56174416e-02],
[-8.76599548e-01],
[ 6.57469674e-02],
[-1.74238041e+00],
[-1.20347600e+00],
[ 2.11221711e-01],
[ 8.76164970e-01]])

```

```

[62]: # define base model
def baseline_model():
    # create model
    model = Sequential()
    model.add(Dense(10, input_dim=8, activation='relu'))

```

```

model.add(Dense(1))
# Compile model
model.compile(loss='mean_squared_error', optimizer='adam')
return model

```

```

[63]: #This is to test the baseline model first using normalized values
model3 = baseline_model()
model3.fit(X_train_scaled,y_train_scaled,epochs=50)

```

```

Epoch 1/50
721/721 [=====] - 2s 2ms/step - loss: 1.6717
Epoch 2/50
721/721 [=====] - 0s 65us/step - loss: 1.3950
Epoch 3/50
721/721 [=====] - 0s 65us/step - loss: 1.1875
Epoch 4/50
721/721 [=====] - 0s 87us/step - loss: 1.0421
Epoch 5/50
721/721 [=====] - 0s 65us/step - loss: 0.9328
Epoch 6/50
721/721 [=====] - 0s 65us/step - loss: 0.8499
Epoch 7/50
721/721 [=====] - 0s 65us/step - loss: 0.7834
Epoch 8/50
721/721 [=====] - 0s 65us/step - loss: 0.7277
Epoch 9/50
721/721 [=====] - 0s 65us/step - loss: 0.6817
Epoch 10/50
721/721 [=====] - 0s 65us/step - loss: 0.6442
Epoch 11/50
721/721 [=====] - 0s 65us/step - loss: 0.6097
Epoch 12/50
721/721 [=====] - 0s 65us/step - loss: 0.5761
Epoch 13/50
721/721 [=====] - 0s 65us/step - loss: 0.5483
Epoch 14/50
721/721 [=====] - 0s 65us/step - loss: 0.5220
Epoch 15/50
721/721 [=====] - 0s 65us/step - loss: 0.4981
Epoch 16/50
721/721 [=====] - 0s 65us/step - loss: 0.4766
Epoch 17/50
721/721 [=====] - 0s 65us/step - loss: 0.4570
Epoch 18/50
721/721 [=====] - 0s 65us/step - loss: 0.4376
Epoch 19/50
721/721 [=====] - 0s 65us/step - loss: 0.4209
Epoch 20/50

```



721/721 [=====] - 0s 65us/step - loss: 0.4041  
Epoch 21/50  
721/721 [=====] - 0s 87us/step - loss: 0.3897  
Epoch 22/50  
721/721 [=====] - 0s 87us/step - loss: 0.3754  
Epoch 23/50  
721/721 [=====] - 0s 87us/step - loss: 0.3622  
Epoch 24/50  
721/721 [=====] - 0s 65us/step - loss: 0.3502  
Epoch 25/50  
721/721 [=====] - 0s 65us/step - loss: 0.3395  
Epoch 26/50  
721/721 [=====] - 0s 65us/step - loss: 0.3287  
Epoch 27/50  
721/721 [=====] - 0s 65us/step - loss: 0.3195  
Epoch 28/50  
721/721 [=====] - 0s 65us/step - loss: 0.3104  
Epoch 29/50  
721/721 [=====] - 0s 108us/step - loss: 0.3016  
Epoch 30/50  
721/721 [=====] - 0s 87us/step - loss: 0.2934  
Epoch 31/50  
721/721 [=====] - 0s 87us/step - loss: 0.2857  
Epoch 32/50  
721/721 [=====] - 0s 65us/step - loss: 0.2782  
Epoch 33/50  
721/721 [=====] - 0s 65us/step - loss: 0.2707  
Epoch 34/50  
721/721 [=====] - 0s 65us/step - loss: 0.2649  
Epoch 35/50  
721/721 [=====] - 0s 87us/step - loss: 0.2581  
Epoch 36/50  
721/721 [=====] - 0s 65us/step - loss: 0.2529  
Epoch 37/50  
721/721 [=====] - 0s 87us/step - loss: 0.2472  
Epoch 38/50  
721/721 [=====] - 0s 87us/step - loss: 0.2425  
Epoch 39/50  
721/721 [=====] - 0s 65us/step - loss: 0.2377  
Epoch 40/50  
721/721 [=====] - 0s 65us/step - loss: 0.2331  
Epoch 41/50  
721/721 [=====] - 0s 87us/step - loss: 0.2279  
Epoch 42/50  
721/721 [=====] - 0s 87us/step - loss: 0.2231  
Epoch 43/50  
721/721 [=====] - 0s 87us/step - loss: 0.2185  
Epoch 44/50

```

721/721 [=====] - 0s 65us/step - loss: 0.2146
Epoch 45/50
721/721 [=====] - 0s 65us/step - loss: 0.2105
Epoch 46/50
721/721 [=====] - 0s 87us/step - loss: 0.2070
Epoch 47/50
721/721 [=====] - 0s 108us/step - loss: 0.2032
Epoch 48/50
721/721 [=====] - 0s 87us/step - loss: 0.2000
Epoch 49/50
721/721 [=====] - 0s 87us/step - loss: 0.1970
Epoch 50/50
721/721 [=====] - 0s 87us/step - loss: 0.1938

```

[63]: <keras.callbacks.History at 0x1fec9b53ef0>

[76]: `model3.summary()`

Model: "sequential\_153"

Layer (type)	Output Shape	Param #
dense_305 (Dense)	(None, 10)	90
dense_306 (Dense)	(None, 1)	11

Total params: 101

Trainable params: 101

Non-trainable params: 0

```

[64]: m = []

for i in range(1,51):
    X_train, X_test, y_train, y_test =
    →train_test_split(X_train_scaled,y_train_scaled, test_size=0.3,
    →random_state=0)
    model3 = baseline_model()
    model3.fit(X_train,y_train,epochs=50)
    y_pred = model3.predict(X_test)
    mse = mean_squared_error(y_test,y_pred)
    m.append(mse)

```

Epoch 1/50

504/504 [=====] - 1s 3ms/step - loss: 1.3874

Epoch 2/50

504/504 [=====] - 0s 62us/step - loss: 1.2120

Epoch 3/50  
504/504 [=====] - 0s 93us/step - loss: 1.0748  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 0.9688  
Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 0.8797  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 0.8107  
Epoch 7/50  
504/504 [=====] - 0s 93us/step - loss: 0.7537  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.7046  
Epoch 9/50  
504/504 [=====] - 0s 93us/step - loss: 0.6626  
Epoch 10/50  
504/504 [=====] - 0s 93us/step - loss: 0.6262  
Epoch 11/50  
504/504 [=====] - 0s 93us/step - loss: 0.5921  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.5646  
Epoch 13/50  
504/504 [=====] - 0s 93us/step - loss: 0.5391  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.5163  
Epoch 15/50  
504/504 [=====] - 0s 93us/step - loss: 0.4956  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4767  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4594  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4446  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.4282  
Epoch 20/50  
504/504 [=====] - 0s 93us/step - loss: 0.4152  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.4016  
Epoch 22/50  
504/504 [=====] - 0s 93us/step - loss: 0.3896  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.3790  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.3671  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3574  
Epoch 26/50  
504/504 [=====] - 0s 93us/step - loss: 0.3472

Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3382  
Epoch 28/50  
504/504 [=====] - 0s 93us/step - loss: 0.3306  
Epoch 29/50  
504/504 [=====] - 0s 93us/step - loss: 0.3212  
Epoch 30/50  
504/504 [=====] - 0s 93us/step - loss: 0.3144  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3070  
Epoch 32/50  
504/504 [=====] - 0s 93us/step - loss: 0.2997  
Epoch 33/50  
504/504 [=====] - 0s 93us/step - loss: 0.2933  
Epoch 34/50  
504/504 [=====] - 0s 93us/step - loss: 0.2876  
Epoch 35/50  
504/504 [=====] - 0s 93us/step - loss: 0.2814  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.2762  
Epoch 37/50  
504/504 [=====] - 0s 93us/step - loss: 0.2701  
Epoch 38/50  
504/504 [=====] - 0s 93us/step - loss: 0.2654  
Epoch 39/50  
504/504 [=====] - 0s 93us/step - loss: 0.2607  
Epoch 40/50  
504/504 [=====] - 0s 93us/step - loss: 0.2564  
Epoch 41/50  
504/504 [=====] - 0s 93us/step - loss: 0.2521  
Epoch 42/50  
504/504 [=====] - 0s 93us/step - loss: 0.2481  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.2447  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.2410  
Epoch 45/50  
504/504 [=====] - 0s 93us/step - loss: 0.2376  
Epoch 46/50  
504/504 [=====] - 0s 94us/step - loss: 0.2350  
Epoch 47/50  
504/504 [=====] - 0s 93us/step - loss: 0.2317  
Epoch 48/50  
504/504 [=====] - 0s 62us/step - loss: 0.2292  
Epoch 49/50  
504/504 [=====] - 0s 93us/step - loss: 0.2262  
Epoch 50/50  
504/504 [=====] - 0s 62us/step - loss: 0.2243

Epoch 1/50  
504/504 [=====] - 2s 3ms/step - loss: 1.1213  
Epoch 2/50  
504/504 [=====] - 0s 93us/step - loss: 0.9980  
Epoch 3/50  
504/504 [=====] - 0s 93us/step - loss: 0.8978  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 0.8171  
Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 0.7585  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 0.7037  
Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 0.6607  
Epoch 8/50  
504/504 [=====] - 0s 93us/step - loss: 0.6221  
Epoch 9/50  
504/504 [=====] - 0s 62us/step - loss: 0.5912  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.5636  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 0.5398  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.5180  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.5009  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.4836  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.4701  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4567  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4459  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4374  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.4294  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4218  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.4153  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.4083  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.4025  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.3964

Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3900  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3840  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3787  
Epoch 28/50  
504/504 [=====] - 0s 93us/step - loss: 0.3740  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3688  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3639  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3594  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3558  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3519  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3482  
Epoch 35/50  
504/504 [=====] - 0s 93us/step - loss: 0.3452  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3412  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.3379  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.3348  
Epoch 39/50  
504/504 [=====] - 0s 62us/step - loss: 0.3317  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.3283  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.3263  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.3224  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.3196  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.3168  
Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.3143  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.3118  
Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.3096  
Epoch 48/50  
504/504 [=====] - 0s 62us/step - loss: 0.3074

Epoch 49/50  
504/504 [=====] - 0s 62us/step - loss: 0.3043  
Epoch 50/50  
504/504 [=====] - 0s 62us/step - loss: 0.3021  
Epoch 1/50  
504/504 [=====] - 2s 3ms/step - loss: 1.9150  
Epoch 2/50  
504/504 [=====] - 0s 93us/step - loss: 1.6685  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 1.4524  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 1.2720  
Epoch 5/50  
504/504 [=====] - 0s 93us/step - loss: 1.1246  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 0.9939  
Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 0.8888  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.7946  
Epoch 9/50  
504/504 [=====] - 0s 62us/step - loss: 0.7214  
Epoch 10/50  
504/504 [=====] - 0s 31us/step - loss: 0.6619  
Epoch 11/50  
504/504 [=====] - 0s 31us/step - loss: 0.6103  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.5712  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.5382  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.5126  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.4914  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4735  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4570  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4426  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.4292  
Epoch 20/50  
504/504 [=====] - 0s 93us/step - loss: 0.4172  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.4069  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.3973

Epoch 23/50  
504/504 [=====] - 0s 93us/step - loss: 0.3880  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.3790  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3708  
Epoch 26/50  
504/504 [=====] - 0s 93us/step - loss: 0.3630  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3552  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3485  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3420  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3358  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3301  
Epoch 32/50  
504/504 [=====] - 0s 31us/step - loss: 0.3248  
Epoch 33/50  
504/504 [=====] - 0s 31us/step - loss: 0.3197  
Epoch 34/50  
504/504 [=====] - 0s 93us/step - loss: 0.3144  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3104  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3060  
Epoch 37/50  
504/504 [=====] - 0s 31us/step - loss: 0.3019  
Epoch 38/50  
504/504 [=====] - 0s 31us/step - loss: 0.2980  
Epoch 39/50  
504/504 [=====] - 0s 62us/step - loss: 0.2940  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.2898  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.2864  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.2822  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.2791  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.2754  
Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.2719  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.2685



Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.2652  
Epoch 48/50  
504/504 [=====] - 0s 93us/step - loss: 0.2617  
Epoch 49/50  
504/504 [=====] - 0s 62us/step - loss: 0.2584  
Epoch 50/50  
504/504 [=====] - 0s 62us/step - loss: 0.2552  
Epoch 1/50  
504/504 [=====] - 2s 3ms/step - loss: 1.5275  
Epoch 2/50  
504/504 [=====] - 0s 62us/step - loss: 1.3592  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 1.2288  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 1.1176  
Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 1.0236  
Epoch 6/50  
504/504 [=====] - 0s 31us/step - loss: 0.9468  
Epoch 7/50  
504/504 [=====] - 0s 31us/step - loss: 0.8814  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.8223  
Epoch 9/50  
504/504 [=====] - 0s 62us/step - loss: 0.7721  
Epoch 10/50  
504/504 [=====] - 0s 93us/step - loss: 0.7304  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 0.6958  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.6656  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.6400  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.6181  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.5975  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.5785  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.5612  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.5448  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.5294  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.5153

Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.5024  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.4898  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.4785  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.4673  
Epoch 25/50  
504/504 [=====] - 0s 93us/step - loss: 0.4584  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.4479  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.4394  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.4312  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.4227  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.4150  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.4074  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.4004  
Epoch 33/50  
504/504 [=====] - 0s 31us/step - loss: 0.3931  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3870  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3813  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3742  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.3684  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.3628  
Epoch 39/50  
504/504 [=====] - 0s 62us/step - loss: 0.3577  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.3520  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.3470  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.3425  
Epoch 43/50  
504/504 [=====] - 0s 31us/step - loss: 0.3373  
Epoch 44/50  
504/504 [=====] - 0s 31us/step - loss: 0.3330

Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.3290  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.3247  
Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.3202  
Epoch 48/50  
504/504 [=====] - 0s 93us/step - loss: 0.3156  
Epoch 49/50  
504/504 [=====] - 0s 62us/step - loss: 0.3119  
Epoch 50/50  
504/504 [=====] - 0s 62us/step - loss: 0.3079  
Epoch 1/50  
504/504 [=====] - 2s 3ms/step - loss: 2.6038  
Epoch 2/50  
504/504 [=====] - 0s 31us/step - loss: 2.2406  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 1.9394  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 1.6932  
Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 1.4864  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 1.3147  
Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 1.1758  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 1.0460  
Epoch 9/50  
504/504 [=====] - 0s 62us/step - loss: 0.9444  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.8532  
Epoch 11/50  
504/504 [=====] - 0s 31us/step - loss: 0.7707  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.7024  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.6439  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.5938  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.5509  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.5173  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4879  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4625

Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.4423  
Epoch 20/50  
504/504 [=====] - 0s 31us/step - loss: 0.4250  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.4099  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.3973  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.3856  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.3764  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3671  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3594  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3520  
Epoch 28/50  
504/504 [=====] - 0s 31us/step - loss: 0.3452  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3391  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3329  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3272  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3222  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3165  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3116  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3068  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3026  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.2977  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.2932  
Epoch 39/50  
504/504 [=====] - 0s 62us/step - loss: 0.2884  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.2845  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.2801  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.2757

Epoch 43/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2711  
 Epoch 44/50  
 504/504 [=====] - 0s 31us/step - loss: 0.2668  
 Epoch 45/50  
 504/504 [=====] - 0s 31us/step - loss: 0.2629  
 Epoch 46/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2590  
 Epoch 47/50  
 504/504 [=====] - 0s 31us/step - loss: 0.2555  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2518  
 Epoch 49/50  
 504/504 [=====] - 0s 31us/step - loss: 0.2487  
 Epoch 50/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2454  
 Epoch 1/50  
 504/504 [=====] - 2s 3ms/step - loss: 1.5004  
 Epoch 2/50  
 504/504 [=====] - 0s 62us/step - loss: 1.3466  
 Epoch 3/50  
 504/504 [=====] - 0s 62us/step - loss: 1.2172  
 Epoch 4/50  
 504/504 [=====] - 0s 93us/step - loss: 1.1129  
 Epoch 5/50  
 504/504 [=====] - 0s 62us/step - loss: 1.0218  
 Epoch 6/50  
 504/504 [=====] - 0s 93us/step - loss: 0.9457  
 Epoch 7/50  
 504/504 [=====] - 0s 62us/step - loss: 0.8792  
 Epoch 8/50  
 504/504 [=====] - 0s 31us/step - loss: 0.8199  
 Epoch 9/50  
 504/504 [=====] - 0s 31us/step - loss: 0.7686  
 Epoch 10/50  
 504/504 [=====] - 0s 62us/step - loss: 0.7212  
 Epoch 11/50  
 504/504 [=====] - 0s 62us/step - loss: 0.6782  
 Epoch 12/50  
 504/504 [=====] - 0s 62us/step - loss: 0.6400  
 Epoch 13/50  
 504/504 [=====] - 0s 62us/step - loss: 0.6052  
 Epoch 14/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5746  
 Epoch 15/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5462  
 Epoch 16/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5197

Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4965  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4775  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.4593  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4441  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.4309  
Epoch 22/50  
504/504 [=====] - 0s 31us/step - loss: 0.4198  
Epoch 23/50  
504/504 [=====] - 0s 31us/step - loss: 0.4091  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.4001  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3922  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3854  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3786  
Epoch 28/50  
504/504 [=====] - 0s 31us/step - loss: 0.3721  
Epoch 29/50  
504/504 [=====] - 0s 31us/step - loss: 0.3656  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3600  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3556  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3496  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3454  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3400  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3359  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3314  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.3274  
Epoch 38/50  
504/504 [=====] - 0s 31us/step - loss: 0.3226  
Epoch 39/50  
504/504 [=====] - 0s 31us/step - loss: 0.3184  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.3132

Epoch 41/50  
504/504 [=====] - 0s 31us/step - loss: 0.3077  
Epoch 42/50  
504/504 [=====] - 0s 31us/step - loss: 0.3022  
Epoch 43/50  
504/504 [=====] - 0s 31us/step - loss: 0.2965  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.2913  
Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.2858  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.2810  
Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.2767  
Epoch 48/50  
504/504 [=====] - 0s 93us/step - loss: 0.2713  
Epoch 49/50  
504/504 [=====] - 0s 62us/step - loss: 0.2664  
Epoch 50/50  
504/504 [=====] - 0s 31us/step - loss: 0.2618  
Epoch 1/50  
504/504 [=====] - 2s 3ms/step - loss: 1.8392  
Epoch 2/50  
504/504 [=====] - 0s 62us/step - loss: 1.6223  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 1.4418  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 1.2960  
Epoch 5/50  
504/504 [=====] - 0s 93us/step - loss: 1.1721  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 1.0688  
Epoch 7/50  
504/504 [=====] - 0s 93us/step - loss: 0.9794  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.8941  
Epoch 9/50  
504/504 [=====] - 0s 93us/step - loss: 0.8250  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.7661  
Epoch 11/50  
504/504 [=====] - 0s 93us/step - loss: 0.7094  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.6598  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.6200  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.5842

Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.5533  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.5257  
Epoch 17/50  
504/504 [=====] - 0s 93us/step - loss: 0.5019  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4823  
Epoch 19/50  
504/504 [=====] - 0s 93us/step - loss: 0.4641  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4492  
Epoch 21/50  
504/504 [=====] - 0s 93us/step - loss: 0.4354  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.4243  
Epoch 23/50  
504/504 [=====] - 0s 31us/step - loss: 0.4127  
Epoch 24/50  
504/504 [=====] - 0s 31us/step - loss: 0.4021  
Epoch 25/50  
504/504 [=====] - 0s 31us/step - loss: 0.3936  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3851  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3777  
Epoch 28/50  
504/504 [=====] - 0s 93us/step - loss: 0.3712  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3643  
Epoch 30/50  
504/504 [=====] - 0s 93us/step - loss: 0.3571  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3516  
Epoch 32/50  
504/504 [=====] - 0s 93us/step - loss: 0.3458  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3397  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3351  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3304  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3244  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.3193  
Epoch 38/50  
504/504 [=====] - 0s 93us/step - loss: 0.3146



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Epoch 39/50
504/504 [=====] - 0s 62us/step - loss: 0.3102
Epoch 40/50
504/504 [=====] - 0s 62us/step - loss: 0.3060
Epoch 41/50
504/504 [=====] - 0s 93us/step - loss: 0.3019
Epoch 42/50
504/504 [=====] - 0s 31us/step - loss: 0.2980
Epoch 43/50
504/504 [=====] - 0s 31us/step - loss: 0.2940
Epoch 44/50
504/504 [=====] - 0s 62us/step - loss: 0.2898
Epoch 45/50
504/504 [=====] - 0s 62us/step - loss: 0.2863
Epoch 46/50
504/504 [=====] - 0s 62us/step - loss: 0.2822
Epoch 47/50
504/504 [=====] - 0s 93us/step - loss: 0.2791
Epoch 48/50
504/504 [=====] - 0s 62us/step - loss: 0.2756
Epoch 49/50
504/504 [=====] - 0s 93us/step - loss: 0.2726
Epoch 50/50
504/504 [=====] - 0s 62us/step - loss: 0.2690
Epoch 1/50
504/504 [=====] - 2s 3ms/step - loss: 1.0211
Epoch 2/50
504/504 [=====] - 0s 62us/step - loss: 0.9122
Epoch 3/50
504/504 [=====] - 0s 62us/step - loss: 0.8275
Epoch 4/50
504/504 [=====] - 0s 62us/step - loss: 0.7644
Epoch 5/50
504/504 [=====] - 0s 62us/step - loss: 0.7098
Epoch 6/50
504/504 [=====] - 0s 62us/step - loss: 0.6666
Epoch 7/50
504/504 [=====] - 0s 62us/step - loss: 0.6301
Epoch 8/50
504/504 [=====] - 0s 62us/step - loss: 0.5999
Epoch 9/50
504/504 [=====] - 0s 62us/step - loss: 0.5731
Epoch 10/50
504/504 [=====] - 0s 62us/step - loss: 0.5510
Epoch 11/50
504/504 [=====] - 0s 62us/step - loss: 0.5298
Epoch 12/50
504/504 [=====] - 0s 62us/step - loss: 0.5107

```

Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.4936  
Epoch 14/50  
504/504 [=====] - 0s 93us/step - loss: 0.4771  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.4618  
Epoch 16/50  
504/504 [=====] - 0s 93us/step - loss: 0.4477  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4340  
Epoch 18/50  
504/504 [=====] - 0s 93us/step - loss: 0.4221  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.4099  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.3994  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.3894  
Epoch 22/50  
504/504 [=====] - 0s 93us/step - loss: 0.3803  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.3725  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.3649  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3582  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3525  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3451  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3399  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3348  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3294  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3247  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3210  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3167  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3128  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3088  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3048

Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.3012  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.2976  
Epoch 39/50  
504/504 [=====] - 0s 62us/step - loss: 0.2944  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.2915  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.2877  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.2851  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.2821  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.2791  
Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.2757  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.2729  
Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.2690  
Epoch 48/50  
504/504 [=====] - 0s 31us/step - loss: 0.2664  
Epoch 49/50  
504/504 [=====] - 0s 31us/step - loss: 0.2632  
Epoch 50/50  
504/504 [=====] - 0s 31us/step - loss: 0.2599  
Epoch 1/50  
504/504 [=====] - 2s 4ms/step - loss: 1.2504  
Epoch 2/50  
504/504 [=====] - 0s 62us/step - loss: 1.0883  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 0.9647  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 0.8743  
Epoch 5/50  
504/504 [=====] - 0s 93us/step - loss: 0.8036  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 0.7449  
Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 0.7004  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.6614  
Epoch 9/50  
504/504 [=====] - 0s 62us/step - loss: 0.6293  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.6018

Epoch 11/50  
504/504 [=====] - 0s 93us/step - loss: 0.5786  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.5571  
Epoch 13/50  
504/504 [=====] - 0s 93us/step - loss: 0.5394  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.5232  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.5093  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4957  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4851  
Epoch 18/50  
504/504 [=====] - 0s 93us/step - loss: 0.4747  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.4656  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4572  
Epoch 21/50  
504/504 [=====] - 0s 93us/step - loss: 0.4509  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.4438  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.4371  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.4316  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.4263  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.4216  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.4170  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.4132  
Epoch 29/50  
504/504 [=====] - 0s 94us/step - loss: 0.4094  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.4059  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.4023  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3984  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3952  
Epoch 34/50  
504/504 [=====] - 0s 93us/step - loss: 0.3922

Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3890  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3860  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.3827  
Epoch 38/50  
504/504 [=====] - 0s 93us/step - loss: 0.3795  
Epoch 39/50  
504/504 [=====] - 0s 62us/step - loss: 0.3763  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.3722  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.3689  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.3658  
Epoch 43/50  
504/504 [=====] - 0s 93us/step - loss: 0.3621  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.3589  
Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.3548  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.3511  
Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.3477  
Epoch 48/50  
504/504 [=====] - 0s 62us/step - loss: 0.3442  
Epoch 49/50  
504/504 [=====] - 0s 62us/step - loss: 0.3415  
Epoch 50/50  
504/504 [=====] - 0s 62us/step - loss: 0.3378  
Epoch 1/50  
504/504 [=====] - 2s 4ms/step - loss: 0.8487  
Epoch 2/50  
504/504 [=====] - 0s 62us/step - loss: 0.7560  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 0.6911  
Epoch 4/50  
504/504 [=====] - 0s 93us/step - loss: 0.6385  
Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 0.5978  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 0.5663  
Epoch 7/50  
504/504 [=====] - 0s 93us/step - loss: 0.5395  
Epoch 8/50  
504/504 [=====] - 0s 93us/step - loss: 0.5167

Epoch 9/50  
504/504 [=====] - 0s 62us/step - loss: 0.4967  
Epoch 10/50  
504/504 [=====] - 0s 93us/step - loss: 0.4799  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 0.4636  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.4491  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.4353  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.4242  
Epoch 15/50  
504/504 [=====] - 0s 93us/step - loss: 0.4118  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4007  
Epoch 17/50  
504/504 [=====] - 0s 63us/step - loss: 0.3903  
Epoch 18/50  
504/504 [=====] - 0s 93us/step - loss: 0.3808  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.3712  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.3619  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.3542  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.3456  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.3380  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.3300  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3222  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3142  
Epoch 27/50  
504/504 [=====] - 0s 93us/step - loss: 0.3072  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.2999  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.2933  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.2872  
Epoch 31/50  
504/504 [=====] - 0s 93us/step - loss: 0.2815  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.2754

Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.2702  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.2651  
Epoch 35/50  
504/504 [=====] - 0s 93us/step - loss: 0.2606  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.2557  
Epoch 37/50  
504/504 [=====] - 0s 93us/step - loss: 0.2512  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.2481  
Epoch 39/50  
504/504 [=====] - 0s 93us/step - loss: 0.2434  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.2399  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.2372  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.2332  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.2307  
Epoch 44/50  
504/504 [=====] - 0s 93us/step - loss: 0.2278  
Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.2256  
Epoch 46/50  
504/504 [=====] - 0s 93us/step - loss: 0.2232  
Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.2207  
Epoch 48/50  
504/504 [=====] - 0s 62us/step - loss: 0.2183  
Epoch 49/50  
504/504 [=====] - 0s 62us/step - loss: 0.2166  
Epoch 50/50  
504/504 [=====] - 0s 62us/step - loss: 0.2145  
Epoch 1/50  
504/504 [=====] - 2s 4ms/step - loss: 2.2609  
Epoch 2/50  
504/504 [=====] - 0s 62us/step - loss: 1.9110  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 1.6216  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 1.4010  
Epoch 5/50  
504/504 [=====] - 0s 93us/step - loss: 1.2194  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 1.0733

Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 0.9533  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.8588  
Epoch 9/50  
504/504 [=====] - 0s 62us/step - loss: 0.7814  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.7108  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 0.6579  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.6113  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.5713  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.5378  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.5077  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4812  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4581  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4384  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.4209  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4054  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.3919  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.3807  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.3699  
Epoch 24/50  
504/504 [=====] - 0s 93us/step - loss: 0.3613  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3525  
Epoch 26/50  
504/504 [=====] - 0s 93us/step - loss: 0.3451  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3381  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3320  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3259  
Epoch 30/50  
504/504 [=====] - 0s 93us/step - loss: 0.3200



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Epoch 31/50
504/504 [=====] - 0s 62us/step - loss: 0.3144
Epoch 32/50
504/504 [=====] - 0s 62us/step - loss: 0.3090
Epoch 33/50
504/504 [=====] - 0s 62us/step - loss: 0.3041
Epoch 34/50
504/504 [=====] - 0s 62us/step - loss: 0.2995
Epoch 35/50
504/504 [=====] - 0s 62us/step - loss: 0.2954
Epoch 36/50
504/504 [=====] - 0s 62us/step - loss: 0.2909
Epoch 37/50
504/504 [=====] - 0s 93us/step - loss: 0.2866
Epoch 38/50
504/504 [=====] - 0s 31us/step - loss: 0.2825
Epoch 39/50
504/504 [=====] - 0s 62us/step - loss: 0.2782
Epoch 40/50
504/504 [=====] - 0s 62us/step - loss: 0.2743
Epoch 41/50
504/504 [=====] - 0s 62us/step - loss: 0.2709
Epoch 42/50
504/504 [=====] - 0s 62us/step - loss: 0.2672
Epoch 43/50
504/504 [=====] - 0s 62us/step - loss: 0.2631
Epoch 44/50
504/504 [=====] - 0s 62us/step - loss: 0.2597
Epoch 45/50
504/504 [=====] - 0s 62us/step - loss: 0.2564
Epoch 46/50
504/504 [=====] - 0s 31us/step - loss: 0.2539
Epoch 47/50
504/504 [=====] - 0s 62us/step - loss: 0.2504
Epoch 48/50
504/504 [=====] - 0s 62us/step - loss: 0.2474
Epoch 49/50
504/504 [=====] - 0s 62us/step - loss: 0.2446
Epoch 50/50
504/504 [=====] - 0s 62us/step - loss: 0.2421
Epoch 1/50
504/504 [=====] - 2s 3ms/step - loss: 1.9689
Epoch 2/50
504/504 [=====] - 0s 62us/step - loss: 1.7442
Epoch 3/50
504/504 [=====] - 0s 62us/step - loss: 1.5481
Epoch 4/50
504/504 [=====] - 0s 62us/step - loss: 1.3895

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Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 1.2530  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 1.1356  
Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 1.0443  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.9569  
Epoch 9/50  
504/504 [=====] - 0s 62us/step - loss: 0.8883  
Epoch 10/50  
504/504 [=====] - 0s 93us/step - loss: 0.8291  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 0.7796  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.7380  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.7014  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.6681  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.6396  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.6138  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.5902  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.5715  
Epoch 19/50  
504/504 [=====] - 0s 93us/step - loss: 0.5534  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.5360  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.5227  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.5080  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.4956  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.4846  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.4738  
Epoch 26/50  
504/504 [=====] - 0s 93us/step - loss: 0.4643  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.4558  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.4473

Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.4392  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.4305  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.4231  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.4160  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.4091  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.4014  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3950  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3889  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.3832  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.3774  
Epoch 39/50  
504/504 [=====] - 0s 62us/step - loss: 0.3715  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.3669  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.3622  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.3571  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.3515  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.3465  
Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.3423  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.3373  
Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.3320  
Epoch 48/50  
504/504 [=====] - 0s 62us/step - loss: 0.3275  
Epoch 49/50  
504/504 [=====] - 0s 62us/step - loss: 0.3227  
Epoch 50/50  
504/504 [=====] - 0s 62us/step - loss: 0.3185  
Epoch 1/50  
504/504 [=====] - 2s 4ms/step - loss: 1.8400  
Epoch 2/50  
504/504 [=====] - 0s 62us/step - loss: 1.5290

Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 1.2978  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 1.1178  
Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 0.9774  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 0.8746  
Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 0.7935  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.7283  
Epoch 9/50  
504/504 [=====] - 0s 62us/step - loss: 0.6784  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.6334  
Epoch 11/50  
504/504 [=====] - 0s 31us/step - loss: 0.6019  
Epoch 12/50  
504/504 [=====] - 0s 31us/step - loss: 0.5721  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.5479  
Epoch 14/50  
504/504 [=====] - 0s 31us/step - loss: 0.5263  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.5096  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4934  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4793  
Epoch 18/50  
504/504 [=====] - 0s 31us/step - loss: 0.4674  
Epoch 19/50  
504/504 [=====] - 0s 31us/step - loss: 0.4563  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4466  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.4370  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.4288  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.4202  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.4128  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.4054  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3990

Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3920  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3856  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3791  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3732  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3677  
Epoch 32/50  
504/504 [=====] - 0s 93us/step - loss: 0.3619  
Epoch 33/50  
504/504 [=====] - 0s 93us/step - loss: 0.3570  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3512  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3456  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3411  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.3362  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.3312  
Epoch 39/50  
504/504 [=====] - 0s 62us/step - loss: 0.3252  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.3207  
Epoch 41/50  
504/504 [=====] - 0s 93us/step - loss: 0.3159  
Epoch 42/50  
504/504 [=====] - 0s 31us/step - loss: 0.3113  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.3070  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.3035  
Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.2989  
Epoch 46/50  
504/504 [=====] - 0s 31us/step - loss: 0.2956  
Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.2908  
Epoch 48/50  
504/504 [=====] - 0s 62us/step - loss: 0.2872  
Epoch 49/50  
504/504 [=====] - 0s 62us/step - loss: 0.2842  
Epoch 50/50  
504/504 [=====] - 0s 31us/step - loss: 0.2804

Epoch 1/50  
504/504 [=====] - 2s 4ms/step - loss: 1.3691  
Epoch 2/50  
504/504 [=====] - 0s 62us/step - loss: 1.1846  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 1.0421  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 0.9327  
Epoch 5/50  
504/504 [=====] - 0s 93us/step - loss: 0.8495  
Epoch 6/50  
504/504 [=====] - 0s 31us/step - loss: 0.7858  
Epoch 7/50  
504/504 [=====] - 0s 31us/step - loss: 0.7333  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.6904  
Epoch 9/50  
504/504 [=====] - 0s 62us/step - loss: 0.6527  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.6208  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 0.5926  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.5671  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.5441  
Epoch 14/50  
504/504 [=====] - 0s 31us/step - loss: 0.5238  
Epoch 15/50  
504/504 [=====] - 0s 31us/step - loss: 0.5056  
Epoch 16/50  
504/504 [=====] - 0s 31us/step - loss: 0.4888  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4734  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4592  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.4468  
Epoch 20/50  
504/504 [=====] - 0s 31us/step - loss: 0.4353  
Epoch 21/50  
504/504 [=====] - 0s 31us/step - loss: 0.4231  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.4131  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.4025  
Epoch 24/50  
504/504 [=====] - 0s 31us/step - loss: 0.3931

Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3836  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3750  
Epoch 27/50  
504/504 [=====] - 0s 31us/step - loss: 0.3659  
Epoch 28/50  
504/504 [=====] - 0s 31us/step - loss: 0.3582  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3514  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3433  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3370  
Epoch 32/50  
504/504 [=====] - 0s 31us/step - loss: 0.3309  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3239  
Epoch 34/50  
504/504 [=====] - 0s 31us/step - loss: 0.3180  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3127  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3065  
Epoch 37/50  
504/504 [=====] - 0s 93us/step - loss: 0.3009  
Epoch 38/50  
504/504 [=====] - 0s 31us/step - loss: 0.2959  
Epoch 39/50  
504/504 [=====] - 0s 31us/step - loss: 0.2906  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.2858  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.2815  
Epoch 42/50  
504/504 [=====] - 0s 31us/step - loss: 0.2775  
Epoch 43/50  
504/504 [=====] - 0s 31us/step - loss: 0.2724  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.2688  
Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.2647  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.2598  
Epoch 47/50  
504/504 [=====] - 0s 31us/step - loss: 0.2557  
Epoch 48/50  
504/504 [=====] - 0s 62us/step - loss: 0.2521

Epoch 49/50  
504/504 [=====] - 0s 62us/step - loss: 0.2495  
Epoch 50/50  
504/504 [=====] - 0s 62us/step - loss: 0.2453  
Epoch 1/50  
504/504 [=====] - 2s 4ms/step - loss: 1.5384  
Epoch 2/50  
504/504 [=====] - 0s 93us/step - loss: 1.2859  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 1.0914  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 0.9405  
Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 0.8284  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 0.7464  
Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 0.6770  
Epoch 8/50  
504/504 [=====] - 0s 93us/step - loss: 0.6265  
Epoch 9/50  
504/504 [=====] - 0s 62us/step - loss: 0.5879  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.5554  
Epoch 11/50  
504/504 [=====] - 0s 93us/step - loss: 0.5310  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.5111  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.4940  
Epoch 14/50  
504/504 [=====] - 0s 93us/step - loss: 0.4813  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.4690  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4594  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4506  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4439  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.4367  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4313  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.4253  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.4198



Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.4156  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.4108  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.4070  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.4034  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3993  
Epoch 28/50  
504/504 [=====] - 0s 93us/step - loss: 0.3955  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3919  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3888  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3860  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3830  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3801  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3776  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3749  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3721  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.3692  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.3664  
Epoch 39/50  
504/504 [=====] - 0s 62us/step - loss: 0.3641  
Epoch 40/50  
504/504 [=====] - 0s 31us/step - loss: 0.3618  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.3590  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.3570  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.3545  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.3515  
Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.3492  
Epoch 46/50  
504/504 [=====] - 0s 93us/step - loss: 0.3467

Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.3442  
Epoch 48/50  
504/504 [=====] - 0s 93us/step - loss: 0.3421  
Epoch 49/50  
504/504 [=====] - 0s 62us/step - loss: 0.3392  
Epoch 50/50  
504/504 [=====] - 0s 93us/step - loss: 0.3374  
Epoch 1/50  
504/504 [=====] - 2s 4ms/step - loss: 1.3283  
Epoch 2/50  
504/504 [=====] - 0s 62us/step - loss: 1.1343  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 1.0055  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 0.9167  
Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 0.8500  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 0.7978  
Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 0.7534  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.7161  
Epoch 9/50  
504/504 [=====] - 0s 62us/step - loss: 0.6815  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.6546  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 0.6318  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.6106  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.5931  
Epoch 14/50  
504/504 [=====] - 0s 31us/step - loss: 0.5762  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.5605  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.5467  
Epoch 17/50  
504/504 [=====] - 0s 93us/step - loss: 0.5342  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.5220  
Epoch 19/50  
504/504 [=====] - 0s 93us/step - loss: 0.5109  
Epoch 20/50  
504/504 [=====] - 0s 93us/step - loss: 0.5001

Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.4906  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.4797  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.4697  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.4602  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.4514  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.4420  
Epoch 27/50  
504/504 [=====] - 0s 93us/step - loss: 0.4332  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.4248  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.4167  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.4086  
Epoch 31/50  
504/504 [=====] - 0s 93us/step - loss: 0.4019  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3941  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3881  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3815  
Epoch 35/50  
504/504 [=====] - 0s 93us/step - loss: 0.3764  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3696  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.3650  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.3598  
Epoch 39/50  
504/504 [=====] - 0s 93us/step - loss: 0.3550  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.3500  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.3460  
Epoch 42/50  
504/504 [=====] - 0s 93us/step - loss: 0.3422  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.3376  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.3327

Epoch 45/50  
504/504 [=====] - 0s 93us/step - loss: 0.3287  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.3251  
Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.3208  
Epoch 48/50  
504/504 [=====] - 0s 62us/step - loss: 0.3173  
Epoch 49/50  
504/504 [=====] - 0s 93us/step - loss: 0.3136  
Epoch 50/50  
504/504 [=====] - 0s 62us/step - loss: 0.3108  
Epoch 1/50  
504/504 [=====] - 2s 4ms/step - loss: 2.0705  
Epoch 2/50  
504/504 [=====] - 0s 62us/step - loss: 1.8087  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 1.5817  
Epoch 4/50  
504/504 [=====] - 0s 93us/step - loss: 1.3865  
Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 1.2209  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 1.0742  
Epoch 7/50  
504/504 [=====] - 0s 93us/step - loss: 0.9453  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.8402  
Epoch 9/50  
504/504 [=====] - 0s 93us/step - loss: 0.7497  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.6797  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 0.6182  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.5711  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.5353  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.5036  
Epoch 15/50  
504/504 [=====] - 0s 93us/step - loss: 0.4800  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4605  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4451  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4322

Epoch 19/50  
504/504 [=====] - 0s 93us/step - loss: 0.4207  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4106  
Epoch 21/50  
504/504 [=====] - 0s 93us/step - loss: 0.4021  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.3942  
Epoch 23/50  
504/504 [=====] - 0s 93us/step - loss: 0.3868  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.3802  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3745  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3686  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3636  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3577  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3519  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3471  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3425  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3373  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3327  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3281  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3232  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3192  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.3136  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.3084  
Epoch 39/50  
504/504 [=====] - 0s 62us/step - loss: 0.3035  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.2983  
Epoch 41/50  
504/504 [=====] - 0s 31us/step - loss: 0.2933  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.2886

```

Epoch 43/50
504/504 [=====] - 0s 62us/step - loss: 0.2837
Epoch 44/50
504/504 [=====] - 0s 62us/step - loss: 0.2794
Epoch 45/50
504/504 [=====] - 0s 93us/step - loss: 0.2745
Epoch 46/50
504/504 [=====] - 0s 62us/step - loss: 0.2702
Epoch 47/50
504/504 [=====] - 0s 93us/step - loss: 0.2664
Epoch 48/50
504/504 [=====] - 0s 62us/step - loss: 0.2627
Epoch 49/50
504/504 [=====] - 0s 93us/step - loss: 0.2587
Epoch 50/50
504/504 [=====] - 0s 62us/step - loss: 0.2556
Epoch 1/50
504/504 [=====] - 2s 4ms/step - loss: 1.1515
Epoch 2/50
504/504 [=====] - 0s 62us/step - loss: 0.9875
Epoch 3/50
504/504 [=====] - 0s 93us/step - loss: 0.8643
Epoch 4/50
504/504 [=====] - 0s 62us/step - loss: 0.7701
Epoch 5/50
504/504 [=====] - 0s 62us/step - loss: 0.6987
Epoch 6/50
504/504 [=====] - 0s 62us/step - loss: 0.6428
Epoch 7/50
504/504 [=====] - 0s 62us/step - loss: 0.5976
Epoch 8/50
504/504 [=====] - 0s 62us/step - loss: 0.5598
Epoch 9/50
504/504 [=====] - 0s 62us/step - loss: 0.5300
Epoch 10/50
504/504 [=====] - 0s 62us/step - loss: 0.5047
Epoch 11/50
504/504 [=====] - 0s 62us/step - loss: 0.4818
Epoch 12/50
504/504 [=====] - 0s 62us/step - loss: 0.4637
Epoch 13/50
504/504 [=====] - 0s 62us/step - loss: 0.4465
Epoch 14/50
504/504 [=====] - 0s 62us/step - loss: 0.4314
Epoch 15/50
504/504 [=====] - 0s 62us/step - loss: 0.4169
Epoch 16/50
504/504 [=====] - 0s 62us/step - loss: 0.4042

```

Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.3929  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.3812  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.3717  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.3617  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.3538  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.3462  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.3389  
Epoch 24/50  
504/504 [=====] - ETA: 0s - loss: 0.220 - 0s 62us/step  
- loss: 0.3327  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3272  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3211  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3159  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3115  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3071  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3030  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.2988  
Epoch 32/50  
504/504 [=====] - 0s 93us/step - loss: 0.2952  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.2915  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.2879  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.2840  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.2798  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.2756  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.2717  
Epoch 39/50  
504/504 [=====] - 0s 62us/step - loss: 0.2677  
Epoch 40/50

504/504 [=====] - 0s 62us/step - loss: 0.2641  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.2606  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.2565  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.2531  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.2503  
Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.2456  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.2424  
Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.2395  
Epoch 48/50  
504/504 [=====] - 0s 62us/step - loss: 0.2369  
Epoch 49/50  
504/504 [=====] - 0s 62us/step - loss: 0.2343  
Epoch 50/50  
504/504 [=====] - 0s 62us/step - loss: 0.2322  
Epoch 1/50  
504/504 [=====] - 2s 4ms/step - loss: 1.0822  
Epoch 2/50  
504/504 [=====] - 0s 73us/step - loss: 0.9959  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 0.9247  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 0.8665  
Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 0.8160  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 0.7694  
Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 0.7298  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.6914  
Epoch 9/50  
504/504 [=====] - 0s 62us/step - loss: 0.6562  
Epoch 10/50  
504/504 [=====] - 0s 93us/step - loss: 0.6220  
Epoch 11/50  
504/504 [=====] - 0s 93us/step - loss: 0.5922  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.5637  
Epoch 13/50  
504/504 [=====] - 0s 93us/step - loss: 0.5363  
Epoch 14/50



504/504 [=====] - 0s 62us/step - loss: 0.5109  
Epoch 15/50  
504/504 [=====] - 0s 93us/step - loss: 0.4898  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4697  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4506  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4330  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.4166  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4021  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.3888  
Epoch 22/50  
504/504 [=====] - 0s 93us/step - loss: 0.3773  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.3676  
Epoch 24/50  
504/504 [=====] - 0s 93us/step - loss: 0.3581  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3490  
Epoch 26/50  
504/504 [=====] - 0s 93us/step - loss: 0.3402  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3336  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3263  
Epoch 29/50  
504/504 [=====] - 0s 93us/step - loss: 0.3185  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3126  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3058  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3002  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.2940  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.2886  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.2840  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.2784  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.2741  
Epoch 38/50

504/504 [=====] - 0s 62us/step - loss: 0.2704  
 Epoch 39/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2654  
 Epoch 40/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2613  
 Epoch 41/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2575  
 Epoch 42/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2541  
 Epoch 43/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2502  
 Epoch 44/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2465  
 Epoch 45/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2436  
 Epoch 46/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2408  
 Epoch 47/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2368  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2341  
 Epoch 49/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2320  
 Epoch 50/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2280  
 Epoch 1/50  
 504/504 [=====] - 2s 4ms/step - loss: 2.2448  
 Epoch 2/50  
 504/504 [=====] - 0s 62us/step - loss: 1.9522  
 Epoch 3/50  
 504/504 [=====] - 0s 62us/step - loss: 1.6952  
 Epoch 4/50  
 504/504 [=====] - 0s 62us/step - loss: 1.4803  
 Epoch 5/50  
 504/504 [=====] - 0s 62us/step - loss: 1.3039  
 Epoch 6/50  
 504/504 [=====] - 0s 62us/step - loss: 1.1484  
 Epoch 7/50  
 504/504 [=====] - 0s 62us/step - loss: 1.0150  
 Epoch 8/50  
 504/504 [=====] - 0s 62us/step - loss: 0.9018  
 Epoch 9/50  
 504/504 [=====] - 0s 93us/step - loss: 0.8002  
 Epoch 10/50  
 504/504 [=====] - 0s 62us/step - loss: 0.7201  
 Epoch 11/50  
 504/504 [=====] - 0s 62us/step - loss: 0.6503  
 Epoch 12/50

504/504 [=====] - 0s 62us/step - loss: 0.5914  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.5453  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.5076  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.4744  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4497  
Epoch 17/50  
504/504 [=====] - 0s 93us/step - loss: 0.4290  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4124  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.3986  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.3873  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.3778  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.3692  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.3615  
Epoch 24/50  
504/504 [=====] - 0s 31us/step - loss: 0.3540  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3474  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3404  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3342  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3280  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3226  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3163  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3110  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3054  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3002  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.2952  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.2905  
Epoch 36/50

504/504 [=====] - 0s 62us/step - loss: 0.2862  
 Epoch 37/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2820  
 Epoch 38/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2780  
 Epoch 39/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2740  
 Epoch 40/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2706  
 Epoch 41/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2674  
 Epoch 42/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2636  
 Epoch 43/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2597  
 Epoch 44/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2563  
 Epoch 45/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2533  
 Epoch 46/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2502  
 Epoch 47/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2475  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2447  
 Epoch 49/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2420  
 Epoch 50/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2395  
 Epoch 1/50  
 504/504 [=====] - 2s 4ms/step - loss: 2.4736  
 Epoch 2/50  
 504/504 [=====] - 0s 62us/step - loss: 2.1501  
 Epoch 3/50  
 504/504 [=====] - 0s 93us/step - loss: 1.8764  
 Epoch 4/50  
 504/504 [=====] - 0s 62us/step - loss: 1.6607  
 Epoch 5/50  
 504/504 [=====] - 0s 62us/step - loss: 1.4867  
 Epoch 6/50  
 504/504 [=====] - 0s 62us/step - loss: 1.3494  
 Epoch 7/50  
 504/504 [=====] - 0s 62us/step - loss: 1.2330  
 Epoch 8/50  
 504/504 [=====] - 0s 62us/step - loss: 1.1335  
 Epoch 9/50  
 504/504 [=====] - 0s 62us/step - loss: 1.0490  
 Epoch 10/50

504/504 [=====] - 0s 62us/step - loss: 0.9708  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 0.9079  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.8514  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.7984  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.7543  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.7131  
Epoch 16/50  
504/504 [=====] - 0s 45us/step - loss: 0.6775  
Epoch 17/50  
504/504 [=====] - 0s 93us/step - loss: 0.6440  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.6143  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.5876  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.5606  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.5382  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.5173  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.4982  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.4817  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.4658  
Epoch 26/50  
504/504 [=====] - 0s 93us/step - loss: 0.4516  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.4389  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.4273  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.4163  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.4058  
Epoch 31/50  
504/504 [=====] - 0s 93us/step - loss: 0.3966  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3874  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3794  
Epoch 34/50

504/504 [=====] - 0s 62us/step - loss: 0.3720  
 Epoch 35/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3648  
 Epoch 36/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3580  
 Epoch 37/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3511  
 Epoch 38/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3454  
 Epoch 39/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3396  
 Epoch 40/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3336  
 Epoch 41/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3289  
 Epoch 42/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3240  
 Epoch 43/50  
 504/504 [=====] - ETA: 0s - loss: 0.241 - 0s 62us/step  
 - loss: 0.3196  
 Epoch 44/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3147  
 Epoch 45/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3107  
 Epoch 46/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3065  
 Epoch 47/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3029  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2988  
 Epoch 49/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2956  
 Epoch 50/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2918  
 Epoch 1/50  
 504/504 [=====] - 2s 4ms/step - loss: 1.3865  
 Epoch 2/50  
 504/504 [=====] - 0s 62us/step - loss: 1.2502  
 Epoch 3/50  
 504/504 [=====] - 0s 62us/step - loss: 1.1355  
 Epoch 4/50  
 504/504 [=====] - 0s 62us/step - loss: 1.0403  
 Epoch 5/50  
 504/504 [=====] - 0s 93us/step - loss: 0.9577  
 Epoch 6/50  
 504/504 [=====] - 0s 62us/step - loss: 0.8798  
 Epoch 7/50  
 504/504 [=====] - 0s 62us/step - loss: 0.8135

Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.7514  
Epoch 9/50  
504/504 [=====] - 0s 62us/step - loss: 0.6961  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.6475  
Epoch 11/50  
504/504 [=====] - 0s 93us/step - loss: 0.6033  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.5661  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.5341  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.5077  
Epoch 15/50  
504/504 [=====] - 0s 93us/step - loss: 0.4872  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4698  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4557  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4450  
Epoch 19/50  
504/504 [=====] - 0s 93us/step - loss: 0.4359  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4293  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.4222  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.4166  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.4109  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.4060  
Epoch 25/50  
504/504 [=====] - 0s 93us/step - loss: 0.4012  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3966  
Epoch 27/50  
504/504 [=====] - 0s 93us/step - loss: 0.3922  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3877  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3835  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3794  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3749

Epoch 32/50  
504/504 [=====] - 0s 93us/step - loss: 0.3710  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3673  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3624  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3594  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3544  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.3507  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.3465  
Epoch 39/50  
504/504 [=====] - 0s 62us/step - loss: 0.3424  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.3384  
Epoch 41/50  
504/504 [=====] - 0s 93us/step - loss: 0.3345  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.3293  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.3244  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.3201  
Epoch 45/50  
504/504 [=====] - 0s 93us/step - loss: 0.3141  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.3090  
Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.3039  
Epoch 48/50  
504/504 [=====] - 0s 63us/step - loss: 0.2992  
Epoch 49/50  
504/504 [=====] - 0s 62us/step - loss: 0.2941  
Epoch 50/50  
504/504 [=====] - 0s 62us/step - loss: 0.2891  
Epoch 1/50  
504/504 [=====] - 2s 4ms/step - loss: 1.0765  
Epoch 2/50  
504/504 [=====] - 0s 62us/step - loss: 0.9443  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 0.8350  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 0.7562  
Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 0.6935



Epoch 6/50  
504/504 [=====] - 0s 93us/step - loss: 0.6455  
Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 0.6070  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.5780  
Epoch 9/50  
504/504 [=====] - 0s 93us/step - loss: 0.5532  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.5339  
Epoch 11/50  
504/504 [=====] - 0s 93us/step - loss: 0.5189  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.5049  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.4928  
Epoch 14/50  
504/504 [=====] - 0s 93us/step - loss: 0.4830  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.4729  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4643  
Epoch 17/50  
504/504 [=====] - 0s 93us/step - loss: 0.4551  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4471  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.4393  
Epoch 20/50  
504/504 [=====] - 0s 93us/step - loss: 0.4318  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.4250  
Epoch 22/50  
504/504 [=====] - 0s 93us/step - loss: 0.4181  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.4118  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.4054  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3991  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3929  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3862  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3802  
Epoch 29/50  
504/504 [=====] - 0s 93us/step - loss: 0.3746

Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3688  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3641  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3583  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3539  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3485  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3441  
Epoch 36/50  
504/504 [=====] - 0s 93us/step - loss: 0.3399  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.3351  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.3306  
Epoch 39/50  
504/504 [=====] - 0s 93us/step - loss: 0.3264  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.3225  
Epoch 41/50  
504/504 [=====] - 0s 93us/step - loss: 0.3180  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.3144  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.3099  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.3057  
Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.3013  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.2973  
Epoch 47/50  
504/504 [=====] - 0s 93us/step - loss: 0.2933  
Epoch 48/50  
504/504 [=====] - 0s 62us/step - loss: 0.2896  
Epoch 49/50  
504/504 [=====] - 0s 62us/step - loss: 0.2861  
Epoch 50/50  
504/504 [=====] - 0s 93us/step - loss: 0.2822  
Epoch 1/50  
504/504 [=====] - 2s 4ms/step - loss: 1.9795  
Epoch 2/50  
504/504 [=====] - 0s 62us/step - loss: 1.6985  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 1.4689

Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 1.2971  
Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 1.1578  
Epoch 6/50  
504/504 [=====] - 0s 93us/step - loss: 1.0528  
Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 0.9642  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.8997  
Epoch 9/50  
504/504 [=====] - 0s 93us/step - loss: 0.8401  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.7948  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 0.7540  
Epoch 12/50  
504/504 [=====] - 0s 93us/step - loss: 0.7205  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.6908  
Epoch 14/50  
504/504 [=====] - 0s 93us/step - loss: 0.6649  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.6432  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.6237  
Epoch 17/50  
504/504 [=====] - ETA: 0s - loss: 0.520 - 0s 62us/step  
- loss: 0.6076  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.5916  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.5783  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.5657  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.5551  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.5444  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.5351  
Epoch 24/50  
504/504 [=====] - 0s 93us/step - loss: 0.5266  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.5180  
Epoch 26/50  
504/504 [=====] - 0s 93us/step - loss: 0.5100  
Epoch 27/50

504/504 [=====] - 0s 62us/step - loss: 0.5028  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.4950  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.4888  
Epoch 30/50  
504/504 [=====] - 0s 93us/step - loss: 0.4822  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.4766  
Epoch 32/50  
504/504 [=====] - 0s 93us/step - loss: 0.4709  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.4654  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.4604  
Epoch 35/50  
504/504 [=====] - 0s 93us/step - loss: 0.4554  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.4506  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.4457  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.4406  
Epoch 39/50  
504/504 [=====] - 0s 62us/step - loss: 0.4366  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.4319  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.4275  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.4229  
Epoch 43/50  
504/504 [=====] - 0s 93us/step - loss: 0.4184  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.4145  
Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.4103  
Epoch 46/50  
504/504 [=====] - 0s 93us/step - loss: 0.4068  
Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.4021  
Epoch 48/50  
504/504 [=====] - 0s 62us/step - loss: 0.3973  
Epoch 49/50  
504/504 [=====] - 0s 62us/step - loss: 0.3942  
Epoch 50/50  
504/504 [=====] - 0s 93us/step - loss: 0.3893  
Epoch 1/50

504/504 [=====] - 2s 4ms/step - loss: 1.8967  
Epoch 2/50  
504/504 [=====] - 0s 62us/step - loss: 1.5767  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 1.3161  
Epoch 4/50  
504/504 [=====] - 0s 93us/step - loss: 1.1114  
Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 0.9599  
Epoch 6/50  
504/504 [=====] - 0s 93us/step - loss: 0.8443  
Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 0.7518  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.6808  
Epoch 9/50  
504/504 [=====] - 0s 93us/step - loss: 0.6248  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.5809  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 0.5453  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.5154  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.4938  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.4744  
Epoch 15/50  
504/504 [=====] - 0s 93us/step - loss: 0.4590  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4465  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4363  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4270  
Epoch 19/50  
504/504 [=====] - 0s 93us/step - loss: 0.4190  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4113  
Epoch 21/50  
504/504 [=====] - 0s 93us/step - loss: 0.4043  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.3981  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.3916  
Epoch 24/50  
504/504 [=====] - 0s 93us/step - loss: 0.3857  
Epoch 25/50

504/504 [=====] - 0s 62us/step - loss: 0.3793  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3740  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3685  
Epoch 28/50  
504/504 [=====] - 0s 93us/step - loss: 0.3635  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3583  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3535  
Epoch 31/50  
504/504 [=====] - 0s 93us/step - loss: 0.3488  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3439  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3394  
Epoch 34/50  
504/504 [=====] - 0s 93us/step - loss: 0.3351  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3303  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3258  
Epoch 37/50  
504/504 [=====] - 0s 93us/step - loss: 0.3216  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.3172  
Epoch 39/50  
504/504 [=====] - 0s 93us/step - loss: 0.3130  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.3084  
Epoch 41/50  
504/504 [=====] - 0s 93us/step - loss: 0.3044  
Epoch 42/50  
504/504 [=====] - 0s 93us/step - loss: 0.2999  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.2961  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.2922  
Epoch 45/50  
504/504 [=====] - 0s 93us/step - loss: 0.2888  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.2853  
Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.2816  
Epoch 48/50  
504/504 [=====] - 0s 62us/step - loss: 0.2785  
Epoch 49/50

504/504 [=====] - 0s 62us/step - loss: 0.2752  
 Epoch 50/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2720  
 Epoch 1/50  
 504/504 [=====] - 2s 4ms/step - loss: 1.2549  
 Epoch 2/50  
 504/504 [=====] - 0s 93us/step - loss: 1.1159  
 Epoch 3/50  
 504/504 [=====] - 0s 93us/step - loss: 0.9952  
 Epoch 4/50  
 504/504 [=====] - 0s 93us/step - loss: 0.9043  
 Epoch 5/50  
 504/504 [=====] - 0s 93us/step - loss: 0.8336  
 Epoch 6/50  
 504/504 [=====] - 0s 62us/step - loss: 0.7742  
 Epoch 7/50  
 504/504 [=====] - 0s 93us/step - loss: 0.7259  
 Epoch 8/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6849  
 Epoch 9/50  
 504/504 [=====] - 0s 62us/step - loss: 0.6507  
 Epoch 10/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6221  
 Epoch 11/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5963  
 Epoch 12/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5749  
 Epoch 13/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5548  
 Epoch 14/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5376  
 Epoch 15/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5211  
 Epoch 16/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5051  
 Epoch 17/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4905  
 Epoch 18/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4764  
 Epoch 19/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4632  
 Epoch 20/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4482  
 Epoch 21/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4341  
 Epoch 22/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4201  
 Epoch 23/50

504/504 [=====] - 0s 93us/step - loss: 0.4093  
Epoch 24/50  
504/504 [=====] - 0s 124us/step - loss: 0.3972  
Epoch 25/50  
504/504 [=====] - 0s 93us/step - loss: 0.3857  
Epoch 26/50  
504/504 [=====] - 0s 93us/step - loss: 0.3755  
Epoch 27/50  
504/504 [=====] - 0s 93us/step - loss: 0.3657  
Epoch 28/50  
504/504 [=====] - 0s 93us/step - loss: 0.3564  
Epoch 29/50  
504/504 [=====] - 0s 93us/step - loss: 0.3483  
Epoch 30/50  
504/504 [=====] - 0s 93us/step - loss: 0.3402  
Epoch 31/50  
504/504 [=====] - 0s 93us/step - loss: 0.3324  
Epoch 32/50  
504/504 [=====] - 0s 93us/step - loss: 0.3256  
Epoch 33/50  
504/504 [=====] - 0s 93us/step - loss: 0.3190  
Epoch 34/50  
504/504 [=====] - 0s 124us/step - loss: 0.3128  
Epoch 35/50  
504/504 [=====] - 0s 93us/step - loss: 0.3067  
Epoch 36/50  
504/504 [=====] - 0s 93us/step - loss: 0.3016  
Epoch 37/50  
504/504 [=====] - 0s 63us/step - loss: 0.2961  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.2916  
Epoch 39/50  
504/504 [=====] - 0s 93us/step - loss: 0.2867  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.2824  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.2781  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.2740  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.2701  
Epoch 44/50  
504/504 [=====] - 0s 93us/step - loss: 0.2662  
Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.2626  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.2596  
Epoch 47/50



504/504 [=====] - 0s 93us/step - loss: 0.2555  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2521  
 Epoch 49/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2488  
 Epoch 50/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2457  
 Epoch 1/50  
 504/504 [=====] - 2s 4ms/step - loss: 1.1954  
 Epoch 2/50  
 504/504 [=====] - 0s 62us/step - loss: 1.0801  
 Epoch 3/50  
 504/504 [=====] - 0s 62us/step - loss: 0.9788  
 Epoch 4/50  
 504/504 [=====] - 0s 93us/step - loss: 0.8930  
 Epoch 5/50  
 504/504 [=====] - 0s 62us/step - loss: 0.8207  
 Epoch 6/50  
 504/504 [=====] - 0s 93us/step - loss: 0.7564  
 Epoch 7/50  
 504/504 [=====] - 0s 62us/step - loss: 0.7005  
 Epoch 8/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6512  
 Epoch 9/50  
 504/504 [=====] - 0s 62us/step - loss: 0.6103  
 Epoch 10/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5750  
 Epoch 11/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5451  
 Epoch 12/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5203  
 Epoch 13/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4975  
 Epoch 14/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4791  
 Epoch 15/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4643  
 Epoch 16/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4504  
 Epoch 17/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4387  
 Epoch 18/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4288  
 Epoch 19/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4198  
 Epoch 20/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4110  
 Epoch 21/50

504/504 [=====] - 0s 93us/step - loss: 0.4035  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.3967  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.3894  
Epoch 24/50  
504/504 [=====] - 0s 93us/step - loss: 0.3834  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3777  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3723  
Epoch 27/50  
504/504 [=====] - 0s 93us/step - loss: 0.3672  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3621  
Epoch 29/50  
504/504 [=====] - 0s 93us/step - loss: 0.3572  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3528  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3486  
Epoch 32/50  
504/504 [=====] - 0s 93us/step - loss: 0.3429  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3396  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3337  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3287  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3245  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.3207  
Epoch 38/50  
504/504 [=====] - 0s 93us/step - loss: 0.3160  
Epoch 39/50  
504/504 [=====] - 0s 62us/step - loss: 0.3120  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.3081  
Epoch 41/50  
504/504 [=====] - 0s 93us/step - loss: 0.3041  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.3002  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.2964  
Epoch 44/50  
504/504 [=====] - 0s 93us/step - loss: 0.2922  
Epoch 45/50

504/504 [=====] - 0s 62us/step - loss: 0.2886  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.2844  
Epoch 47/50  
504/504 [=====] - 0s 93us/step - loss: 0.2805  
Epoch 48/50  
504/504 [=====] - 0s 62us/step - loss: 0.2765  
Epoch 49/50  
504/504 [=====] - 0s 93us/step - loss: 0.2733  
Epoch 50/50  
504/504 [=====] - 0s 62us/step - loss: 0.2689  
Epoch 1/50  
504/504 [=====] - 2s 4ms/step - loss: 1.6718  
Epoch 2/50  
504/504 [=====] - 0s 93us/step - loss: 1.5101  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 1.3705  
Epoch 4/50  
504/504 [=====] - 0s 93us/step - loss: 1.2544  
Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 1.1564  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 1.0728  
Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 0.9979  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.9310  
Epoch 9/50  
504/504 [=====] - 0s 93us/step - loss: 0.8685  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.8118  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 0.7644  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.7184  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.6801  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.6457  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.6176  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.5913  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.5694  
Epoch 18/50  
504/504 [=====] - 0s 93us/step - loss: 0.5497  
Epoch 19/50

504/504 [=====] - 0s 62us/step - loss: 0.5342  
 Epoch 20/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5192  
 Epoch 21/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5062  
 Epoch 22/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4947  
 Epoch 23/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4842  
 Epoch 24/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4747  
 Epoch 25/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4655  
 Epoch 26/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4572  
 Epoch 27/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4489  
 Epoch 28/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4419  
 Epoch 29/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4352  
 Epoch 30/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4286  
 Epoch 31/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4225  
 Epoch 32/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4159  
 Epoch 33/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4097  
 Epoch 34/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4037  
 Epoch 35/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3969  
 Epoch 36/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3909  
 Epoch 37/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3844  
 Epoch 38/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3786  
 Epoch 39/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3730  
 Epoch 40/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3672  
 Epoch 41/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3623  
 Epoch 42/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3566  
 Epoch 43/50

504/504 [=====] - 0s 62us/step - loss: 0.3517  
 Epoch 44/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3466  
 Epoch 45/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3425  
 Epoch 46/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3384  
 Epoch 47/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3325  
 Epoch 48/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3277  
 Epoch 49/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3231  
 Epoch 50/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3181  
 Epoch 1/50  
 504/504 [=====] - 2s 4ms/step - loss: 3.0176  
 Epoch 2/50  
 504/504 [=====] - 0s 93us/step - loss: 2.5765  
 Epoch 3/50  
 504/504 [=====] - 0s 62us/step - loss: 2.2208  
 Epoch 4/50  
 504/504 [=====] - 0s 62us/step - loss: 1.9294  
 Epoch 5/50  
 504/504 [=====] - 0s 62us/step - loss: 1.6947  
 Epoch 6/50  
 504/504 [=====] - 0s 62us/step - loss: 1.5038  
 Epoch 7/50  
 504/504 [=====] - 0s 62us/step - loss: 1.3526  
 Epoch 8/50  
 504/504 [=====] - 0s 93us/step - loss: 1.2284  
 Epoch 9/50  
 504/504 [=====] - 0s 62us/step - loss: 1.1208  
 Epoch 10/50  
 504/504 [=====] - 0s 93us/step - loss: 1.0346  
 Epoch 11/50  
 504/504 [=====] - 0s 62us/step - loss: 0.9590  
 Epoch 12/50  
 504/504 [=====] - 0s 62us/step - loss: 0.8941  
 Epoch 13/50  
 504/504 [=====] - 0s 93us/step - loss: 0.8362  
 Epoch 14/50  
 504/504 [=====] - 0s 62us/step - loss: 0.7874  
 Epoch 15/50  
 504/504 [=====] - 0s 93us/step - loss: 0.7413  
 Epoch 16/50  
 504/504 [=====] - 0s 62us/step - loss: 0.7021  
 Epoch 17/50

504/504 [=====] - 0s 62us/step - loss: 0.6645  
 Epoch 18/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6321  
 Epoch 19/50  
 504/504 [=====] - 0s 62us/step - loss: 0.6020  
 Epoch 20/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5770  
 Epoch 21/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5538  
 Epoch 22/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5334  
 Epoch 23/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5151  
 Epoch 24/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4997  
 Epoch 25/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4848  
 Epoch 26/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4727  
 Epoch 27/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4615  
 Epoch 28/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4513  
 Epoch 29/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4423  
 Epoch 30/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4338  
 Epoch 31/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4267  
 Epoch 32/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4194  
 Epoch 33/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4132  
 Epoch 34/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4080  
 Epoch 35/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4023  
 Epoch 36/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3977  
 Epoch 37/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3923  
 Epoch 38/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3880  
 Epoch 39/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3831  
 Epoch 40/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3793  
 Epoch 41/50

504/504 [=====] - 0s 62us/step - loss: 0.3755  
 Epoch 42/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3716  
 Epoch 43/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3678  
 Epoch 44/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3643  
 Epoch 45/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3602  
 Epoch 46/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3571  
 Epoch 47/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3539  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3506  
 Epoch 49/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3474  
 Epoch 50/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3447  
 Epoch 1/50  
 504/504 [=====] - 2s 4ms/step - loss: 1.1595  
 Epoch 2/50  
 504/504 [=====] - 0s 93us/step - loss: 1.0130  
 Epoch 3/50  
 504/504 [=====] - 0s 62us/step - loss: 0.8835  
 Epoch 4/50  
 504/504 [=====] - 0s 93us/step - loss: 0.8028  
 Epoch 5/50  
 504/504 [=====] - 0s 72us/step - loss: 0.7368  
 Epoch 6/50  
 504/504 [=====] - 0s 62us/step - loss: 0.6861  
 Epoch 7/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6441  
 Epoch 8/50  
 504/504 [=====] - 0s 62us/step - loss: 0.6094  
 Epoch 9/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5777  
 Epoch 10/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5485  
 Epoch 11/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5229  
 Epoch 12/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4984  
 Epoch 13/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4774  
 Epoch 14/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4588  
 Epoch 15/50

504/504 [=====] - 0s 62us/step - loss: 0.4400  
Epoch 16/50  
504/504 [=====] - 0s 93us/step - loss: 0.4252  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4106  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.3978  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.3876  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.3768  
Epoch 21/50  
504/504 [=====] - 0s 93us/step - loss: 0.3680  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.3594  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.3520  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.3447  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3376  
Epoch 26/50  
504/504 [=====] - 0s 93us/step - loss: 0.3313  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3253  
Epoch 28/50  
504/504 [=====] - 0s 93us/step - loss: 0.3193  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3144  
Epoch 30/50  
504/504 [=====] - 0s 93us/step - loss: 0.3093  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3044  
Epoch 32/50  
504/504 [=====] - 0s 93us/step - loss: 0.2998  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.2953  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.2901  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.2856  
Epoch 36/50  
504/504 [=====] - 0s 93us/step - loss: 0.2817  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.2776  
Epoch 38/50  
504/504 [=====] - 0s 93us/step - loss: 0.2736  
Epoch 39/50



504/504 [=====] - 0s 62us/step - loss: 0.2702  
Epoch 40/50  
504/504 [=====] - 0s 93us/step - loss: 0.2671  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.2631  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.2601  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.2567  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.2541  
Epoch 45/50  
504/504 [=====] - 0s 93us/step - loss: 0.2510  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.2480  
Epoch 47/50  
504/504 [=====] - 0s 93us/step - loss: 0.2459  
Epoch 48/50  
504/504 [=====] - 0s 62us/step - loss: 0.2442  
Epoch 49/50  
504/504 [=====] - 0s 62us/step - loss: 0.2407  
Epoch 50/50  
504/504 [=====] - 0s 93us/step - loss: 0.2379  
Epoch 1/50  
504/504 [=====] - 2s 4ms/step - loss: 1.0360  
Epoch 2/50  
504/504 [=====] - 0s 93us/step - loss: 0.9356  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 0.8565  
Epoch 4/50  
504/504 [=====] - 0s 93us/step - loss: 0.7967  
Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 0.7477  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 0.7100  
Epoch 7/50  
504/504 [=====] - 0s 71us/step - loss: 0.6788  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.6552  
Epoch 9/50  
504/504 [=====] - 0s 93us/step - loss: 0.6318  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.6119  
Epoch 11/50  
504/504 [=====] - 0s 93us/step - loss: 0.5942  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.5793  
Epoch 13/50

504/504 [=====] - 0s 62us/step - loss: 0.5634  
Epoch 14/50  
504/504 [=====] - 0s 93us/step - loss: 0.5498  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.5361  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.5220  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.5083  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4962  
Epoch 19/50  
504/504 [=====] - 0s 93us/step - loss: 0.4851  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4747  
Epoch 21/50  
504/504 [=====] - 0s 93us/step - loss: 0.4653  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.4568  
Epoch 23/50  
504/504 [=====] - 0s 93us/step - loss: 0.4492  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.4414  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.4346  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.4269  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.4203  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.4136  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.4072  
Epoch 30/50  
504/504 [=====] - 0s 93us/step - loss: 0.4010  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3947  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3896  
Epoch 33/50  
504/504 [=====] - 0s 93us/step - loss: 0.3829  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3781  
Epoch 35/50  
504/504 [=====] - 0s 93us/step - loss: 0.3721  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3683  
Epoch 37/50

504/504 [=====] - 0s 93us/step - loss: 0.3607  
 Epoch 38/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3552  
 Epoch 39/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3506  
 Epoch 40/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3447  
 Epoch 41/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3400  
 Epoch 42/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3353  
 Epoch 43/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3309  
 Epoch 44/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3266  
 Epoch 45/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3215  
 Epoch 46/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3163  
 Epoch 47/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3124  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3081  
 Epoch 49/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3030  
 Epoch 50/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2988  
 Epoch 1/50  
 504/504 [=====] - 2s 4ms/step - loss: 1.5421  
 Epoch 2/50  
 504/504 [=====] - 0s 95us/step - loss: 1.3155  
 Epoch 3/50  
 504/504 [=====] - 0s 63us/step - loss: 1.1366  
 Epoch 4/50  
 504/504 [=====] - 0s 93us/step - loss: 1.0026  
 Epoch 5/50  
 504/504 [=====] - 0s 62us/step - loss: 0.9005  
 Epoch 6/50  
 504/504 [=====] - 0s 93us/step - loss: 0.8218  
 Epoch 7/50  
 504/504 [=====] - 0s 62us/step - loss: 0.7595  
 Epoch 8/50  
 504/504 [=====] - 0s 93us/step - loss: 0.7125  
 Epoch 9/50  
 504/504 [=====] - 0s 62us/step - loss: 0.6729  
 Epoch 10/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6391  
 Epoch 11/50

504/504 [=====] - 0s 62us/step - loss: 0.6120  
Epoch 12/50  
504/504 [=====] - 0s 93us/step - loss: 0.5863  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.5623  
Epoch 14/50  
504/504 [=====] - 0s 93us/step - loss: 0.5425  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.5248  
Epoch 16/50  
504/504 [=====] - 0s 93us/step - loss: 0.5089  
Epoch 17/50  
504/504 [=====] - 0s 64us/step - loss: 0.4945  
Epoch 18/50  
504/504 [=====] - 0s 93us/step - loss: 0.4813  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.4697  
Epoch 20/50  
504/504 [=====] - 0s 93us/step - loss: 0.4590  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.4482  
Epoch 22/50  
504/504 [=====] - 0s 93us/step - loss: 0.4392  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.4307  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.4226  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.4150  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.4084  
Epoch 27/50  
504/504 [=====] - 0s 93us/step - loss: 0.4014  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3950  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3887  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3825  
Epoch 31/50  
504/504 [=====] - 0s 93us/step - loss: 0.3766  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3711  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3653  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3600  
Epoch 35/50

504/504 [=====] - 0s 62us/step - loss: 0.3543  
 Epoch 36/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3487  
 Epoch 37/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3433  
 Epoch 38/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3380  
 Epoch 39/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3334  
 Epoch 40/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3281  
 Epoch 41/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3230  
 Epoch 42/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3183  
 Epoch 43/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3131  
 Epoch 44/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3087  
 Epoch 45/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3035  
 Epoch 46/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2994  
 Epoch 47/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2946  
 Epoch 48/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2907  
 Epoch 49/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2853  
 Epoch 50/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2813  
 Epoch 1/50  
 504/504 [=====] - 2s 5ms/step - loss: 3.0081  
 Epoch 2/50  
 504/504 [=====] - 0s 62us/step - loss: 2.6365  
 Epoch 3/50  
 504/504 [=====] - 0s 62us/step - loss: 2.3181  
 Epoch 4/50  
 504/504 [=====] - 0s 62us/step - loss: 2.0567  
 Epoch 5/50  
 504/504 [=====] - 0s 93us/step - loss: 1.8345  
 Epoch 6/50  
 504/504 [=====] - 0s 62us/step - loss: 1.6467  
 Epoch 7/50  
 504/504 [=====] - 0s 93us/step - loss: 1.4854  
 Epoch 8/50  
 504/504 [=====] - 0s 62us/step - loss: 1.3506  
 Epoch 9/50

504/504 [=====] - 0s 62us/step - loss: 1.2318  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 1.1299  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 1.0411  
Epoch 12/50  
504/504 [=====] - 0s 93us/step - loss: 0.9645  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.8993  
Epoch 14/50  
504/504 [=====] - 0s 93us/step - loss: 0.8413  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.7920  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.7504  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.7133  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.6828  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.6552  
Epoch 20/50  
504/504 [=====] - 0s 93us/step - loss: 0.6313  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.6109  
Epoch 22/50  
504/504 [=====] - 0s 93us/step - loss: 0.5928  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.5768  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.5632  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.5509  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.5396  
Epoch 27/50  
504/504 [=====] - 0s 93us/step - loss: 0.5299  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.5211  
Epoch 29/50  
504/504 [=====] - 0s 93us/step - loss: 0.5125  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.5057  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.4989  
Epoch 32/50  
504/504 [=====] - 0s 93us/step - loss: 0.4932  
Epoch 33/50

504/504 [=====] - 0s 62us/step - loss: 0.4871  
 Epoch 34/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4818  
 Epoch 35/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4773  
 Epoch 36/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4723  
 Epoch 37/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4671  
 Epoch 38/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4633  
 Epoch 39/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4582  
 Epoch 40/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4538  
 Epoch 41/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4492  
 Epoch 42/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4449  
 Epoch 43/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4411  
 Epoch 44/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4367  
 Epoch 45/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4327  
 Epoch 46/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4286  
 Epoch 47/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4246  
 Epoch 48/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4210  
 Epoch 49/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4173  
 Epoch 50/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4135  
 Epoch 1/50  
 504/504 [=====] - 2s 5ms/step - loss: 1.8557  
 Epoch 2/50  
 504/504 [=====] - 0s 62us/step - loss: 1.6228  
 Epoch 3/50  
 504/504 [=====] - 0s 93us/step - loss: 1.4311  
 Epoch 4/50  
 504/504 [=====] - 0s 62us/step - loss: 1.2842  
 Epoch 5/50  
 504/504 [=====] - 0s 93us/step - loss: 1.1672  
 Epoch 6/50  
 504/504 [=====] - 0s 62us/step - loss: 1.0679  
 Epoch 7/50

504/504 [=====] - 0s 93us/step - loss: 0.9855  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.9140  
Epoch 9/50  
504/504 [=====] - 0s 93us/step - loss: 0.8492  
Epoch 10/50  
504/504 [=====] - 0s 93us/step - loss: 0.7904  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 0.7373  
Epoch 12/50  
504/504 [=====] - 0s 93us/step - loss: 0.6908  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.6443  
Epoch 14/50  
504/504 [=====] - 0s 93us/step - loss: 0.6025  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.5641  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.5304  
Epoch 17/50  
504/504 [=====] - 0s 93us/step - loss: 0.4973  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4715  
Epoch 19/50  
504/504 [=====] - 0s 93us/step - loss: 0.4474  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4283  
Epoch 21/50  
504/504 [=====] - 0s 93us/step - loss: 0.4104  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.3962  
Epoch 23/50  
504/504 [=====] - 0s 97us/step - loss: 0.3850  
Epoch 24/50  
504/504 [=====] - 0s 52us/step - loss: 0.3738  
Epoch 25/50  
504/504 [=====] - 0s 93us/step - loss: 0.3650  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3567  
Epoch 27/50  
504/504 [=====] - 0s 93us/step - loss: 0.3493  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3426  
Epoch 29/50  
504/504 [=====] - 0s 93us/step - loss: 0.3370  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3315  
Epoch 31/50



504/504 [=====] - 0s 93us/step - loss: 0.3269  
 Epoch 32/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3218  
 Epoch 33/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3180  
 Epoch 34/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3142  
 Epoch 35/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3099  
 Epoch 36/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3065  
 Epoch 37/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3033  
 Epoch 38/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2997  
 Epoch 39/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2968  
 Epoch 40/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2938  
 Epoch 41/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2900  
 Epoch 42/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2876  
 Epoch 43/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2847  
 Epoch 44/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2818  
 Epoch 45/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2785  
 Epoch 46/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2759  
 Epoch 47/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2724  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2687  
 Epoch 49/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2658  
 Epoch 50/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2626  
 Epoch 1/50  
 504/504 [=====] - 2s 5ms/step - loss: 1.8401  
 Epoch 2/50  
 504/504 [=====] - 0s 62us/step - loss: 1.6286  
 Epoch 3/50  
 504/504 [=====] - 0s 93us/step - loss: 1.4378  
 Epoch 4/50  
 504/504 [=====] - 0s 62us/step - loss: 1.2857  
 Epoch 5/50

504/504 [=====] - 0s 93us/step - loss: 1.1486  
 Epoch 6/50  
 504/504 [=====] - 0s 62us/step - loss: 1.0356  
 Epoch 7/50  
 504/504 [=====] - 0s 93us/step - loss: 0.9399  
 Epoch 8/50  
 504/504 [=====] - 0s 62us/step - loss: 0.8584  
 Epoch 9/50  
 504/504 [=====] - 0s 93us/step - loss: 0.7876  
 Epoch 10/50  
 504/504 [=====] - 0s 62us/step - loss: 0.7253  
 Epoch 11/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6697  
 Epoch 12/50  
 504/504 [=====] - 0s 62us/step - loss: 0.6235  
 Epoch 13/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5822  
 Epoch 14/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5470  
 Epoch 15/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5184  
 Epoch 16/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4939  
 Epoch 17/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4727  
 Epoch 18/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4552  
 Epoch 19/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4398  
 Epoch 20/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4259  
 Epoch 21/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4147  
 Epoch 22/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4033  
 Epoch 23/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3942  
 Epoch 24/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3854  
 Epoch 25/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3770  
 Epoch 26/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3698  
 Epoch 27/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3633  
 Epoch 28/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3570  
 Epoch 29/50

504/504 [=====] - 0s 62us/step - loss: 0.3516  
 Epoch 30/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3467  
 Epoch 31/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3421  
 Epoch 32/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3372  
 Epoch 33/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3324  
 Epoch 34/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3286  
 Epoch 35/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3241  
 Epoch 36/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3199  
 Epoch 37/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3160  
 Epoch 38/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3125  
 Epoch 39/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3092  
 Epoch 40/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3059  
 Epoch 41/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3021  
 Epoch 42/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2982  
 Epoch 43/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2951  
 Epoch 44/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2919  
 Epoch 45/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2889  
 Epoch 46/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2846  
 Epoch 47/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2814  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2776  
 Epoch 49/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2745  
 Epoch 50/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2711  
 Epoch 1/50  
 504/504 [=====] - 2s 5ms/step - loss: 1.8048  
 Epoch 2/50  
 504/504 [=====] - 0s 62us/step - loss: 1.5897  
 Epoch 3/50

504/504 [=====] - 0s 93us/step - loss: 1.4171  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 1.2821  
Epoch 5/50  
504/504 [=====] - 0s 93us/step - loss: 1.1830  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 1.1000  
Epoch 7/50  
504/504 [=====] - 0s 93us/step - loss: 1.0376  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.9830  
Epoch 9/50  
504/504 [=====] - 0s 93us/step - loss: 0.9379  
Epoch 10/50  
504/504 [=====] - 0s 93us/step - loss: 0.9009  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 0.8676  
Epoch 12/50  
504/504 [=====] - 0s 93us/step - loss: 0.8373  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.8110  
Epoch 14/50  
504/504 [=====] - 0s 93us/step - loss: 0.7880  
Epoch 15/50  
504/504 [=====] - 0s 93us/step - loss: 0.7658  
Epoch 16/50  
504/504 [=====] - 0s 57us/step - loss: 0.7457  
Epoch 17/50  
504/504 [=====] - 0s 93us/step - loss: 0.7271  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.7098  
Epoch 19/50  
504/504 [=====] - 0s 93us/step - loss: 0.6930  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.6778  
Epoch 21/50  
504/504 [=====] - 0s 93us/step - loss: 0.6618  
Epoch 22/50  
504/504 [=====] - 0s 93us/step - loss: 0.6501  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.6346  
Epoch 24/50  
504/504 [=====] - 0s 93us/step - loss: 0.6214  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.6074  
Epoch 26/50  
504/504 [=====] - 0s 93us/step - loss: 0.5945  
Epoch 27/50

504/504 [=====] - 0s 62us/step - loss: 0.5813  
 Epoch 28/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5695  
 Epoch 29/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5562  
 Epoch 30/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5448  
 Epoch 31/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5331  
 Epoch 32/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5219  
 Epoch 33/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5114  
 Epoch 34/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5018  
 Epoch 35/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4920  
 Epoch 36/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4829  
 Epoch 37/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4737  
 Epoch 38/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4662  
 Epoch 39/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4570  
 Epoch 40/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4492  
 Epoch 41/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4417  
 Epoch 42/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4348  
 Epoch 43/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4280  
 Epoch 44/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4221  
 Epoch 45/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4153  
 Epoch 46/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4093  
 Epoch 47/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4037  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3989  
 Epoch 49/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3944  
 Epoch 50/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3903  
 Epoch 1/50

504/504 [=====] - 2s 5ms/step - loss: 1.3936  
Epoch 2/50  
504/504 [=====] - 0s 62us/step - loss: 1.2513  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 1.1343  
Epoch 4/50  
504/504 [=====] - 0s 93us/step - loss: 1.0446  
Epoch 5/50  
504/504 [=====] - 0s 68us/step - loss: 0.9730  
Epoch 6/50  
504/504 [=====] - 0s 93us/step - loss: 0.9084  
Epoch 7/50  
504/504 [=====] - 0s 93us/step - loss: 0.8538  
Epoch 8/50  
504/504 [=====] - 0s 93us/step - loss: 0.8028  
Epoch 9/50  
504/504 [=====] - 0s 93us/step - loss: 0.7599  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.7197  
Epoch 11/50  
504/504 [=====] - 0s 93us/step - loss: 0.6810  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.6452  
Epoch 13/50  
504/504 [=====] - 0s 93us/step - loss: 0.6140  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.5833  
Epoch 15/50  
504/504 [=====] - 0s 124us/step - loss: 0.5549  
Epoch 16/50  
504/504 [=====] - 0s 93us/step - loss: 0.5308  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.5090  
Epoch 18/50  
504/504 [=====] - 0s 93us/step - loss: 0.4901  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.4729  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4584  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.4467  
Epoch 22/50  
504/504 [=====] - 0s 93us/step - loss: 0.4346  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.4255  
Epoch 24/50  
504/504 [=====] - 0s 93us/step - loss: 0.4176  
Epoch 25/50

504/504 [=====] - 0s 93us/step - loss: 0.4102  
Epoch 26/50  
504/504 [=====] - 0s 93us/step - loss: 0.4035  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3968  
Epoch 28/50  
504/504 [=====] - 0s 93us/step - loss: 0.3904  
Epoch 29/50  
504/504 [=====] - 0s 93us/step - loss: 0.3854  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3798  
Epoch 31/50  
504/504 [=====] - 0s 93us/step - loss: 0.3751  
Epoch 32/50  
504/504 [=====] - 0s 93us/step - loss: 0.3715  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3659  
Epoch 34/50  
504/504 [=====] - 0s 93us/step - loss: 0.3609  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.3561  
Epoch 36/50  
504/504 [=====] - 0s 93us/step - loss: 0.3512  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.3467  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.3428  
Epoch 39/50  
504/504 [=====] - 0s 62us/step - loss: 0.3384  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.3342  
Epoch 41/50  
504/504 [=====] - 0s 93us/step - loss: 0.3295  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.3259  
Epoch 43/50  
504/504 [=====] - 0s 93us/step - loss: 0.3218  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.3187  
Epoch 45/50  
504/504 [=====] - 0s 93us/step - loss: 0.3152  
Epoch 46/50  
504/504 [=====] - 0s 93us/step - loss: 0.3113  
Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.3078  
Epoch 48/50  
504/504 [=====] - 0s 93us/step - loss: 0.3057  
Epoch 49/50

504/504 [=====] - 0s 93us/step - loss: 0.3013  
 Epoch 50/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2982  
 Epoch 1/50  
 504/504 [=====] - 3s 5ms/step - loss: 1.3245  
 Epoch 2/50  
 504/504 [=====] - 0s 93us/step - loss: 1.1718  
 Epoch 3/50  
 504/504 [=====] - 0s 55us/step - loss: 1.0365  
 Epoch 4/50  
 504/504 [=====] - 0s 93us/step - loss: 0.9222  
 Epoch 5/50  
 504/504 [=====] - 0s 93us/step - loss: 0.8276  
 Epoch 6/50  
 504/504 [=====] - 0s 62us/step - loss: 0.7421  
 Epoch 7/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6736  
 Epoch 8/50  
 504/504 [=====] - 0s 62us/step - loss: 0.6136  
 Epoch 9/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5671  
 Epoch 10/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5253  
 Epoch 11/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4934  
 Epoch 12/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4667  
 Epoch 13/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4440  
 Epoch 14/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4258  
 Epoch 15/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4108  
 Epoch 16/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3985  
 Epoch 17/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3864  
 Epoch 18/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3759  
 Epoch 19/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3669  
 Epoch 20/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3578  
 Epoch 21/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3503  
 Epoch 22/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3428  
 Epoch 23/50



504/504 [=====] - 0s 62us/step - loss: 0.3346  
Epoch 24/50  
504/504 [=====] - 0s 93us/step - loss: 0.3272  
Epoch 25/50  
504/504 [=====] - 0s 93us/step - loss: 0.3205  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3138  
Epoch 27/50  
504/504 [=====] - 0s 93us/step - loss: 0.3076  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3016  
Epoch 29/50  
504/504 [=====] - 0s 93us/step - loss: 0.2961  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.2907  
Epoch 31/50  
504/504 [=====] - 0s 93us/step - loss: 0.2853  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.2804  
Epoch 33/50  
504/504 [=====] - 0s 93us/step - loss: 0.2755  
Epoch 34/50  
504/504 [=====] - 0s 63us/step - loss: 0.2712  
Epoch 35/50  
504/504 [=====] - 0s 93us/step - loss: 0.2665  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.2622  
Epoch 37/50  
504/504 [=====] - 0s 93us/step - loss: 0.2582  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.2549  
Epoch 39/50  
504/504 [=====] - 0s 93us/step - loss: 0.2514  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.2478  
Epoch 41/50  
504/504 [=====] - 0s 93us/step - loss: 0.2440  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.2412  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.2379  
Epoch 44/50  
504/504 [=====] - 0s 93us/step - loss: 0.2350  
Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.2322  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.2294  
Epoch 47/50

504/504 [=====] - 0s 93us/step - loss: 0.2266  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2245  
 Epoch 49/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2218  
 Epoch 50/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2196  
 Epoch 1/50  
 504/504 [=====] - 3s 5ms/step - loss: 1.2481  
 Epoch 2/50  
 504/504 [=====] - 0s 93us/step - loss: 1.0670  
 Epoch 3/50  
 504/504 [=====] - 0s 62us/step - loss: 0.9241  
 Epoch 4/50  
 504/504 [=====] - 0s 93us/step - loss: 0.8179  
 Epoch 5/50  
 504/504 [=====] - 0s 62us/step - loss: 0.7328  
 Epoch 6/50  
 504/504 [=====] - 0s 62us/step - loss: 0.6664  
 Epoch 7/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6147  
 Epoch 8/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5733  
 Epoch 9/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5377  
 Epoch 10/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5091  
 Epoch 11/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4847  
 Epoch 12/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4645  
 Epoch 13/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4477  
 Epoch 14/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4316  
 Epoch 15/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4194  
 Epoch 16/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4061  
 Epoch 17/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3953  
 Epoch 18/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3863  
 Epoch 19/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3769  
 Epoch 20/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3687  
 Epoch 21/50

504/504 [=====] - 0s 62us/step - loss: 0.3600  
Epoch 22/50  
504/504 [=====] - 0s 93us/step - loss: 0.3532  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.3462  
Epoch 24/50  
504/504 [=====] - 0s 93us/step - loss: 0.3395  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3338  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3274  
Epoch 27/50  
504/504 [=====] - 0s 93us/step - loss: 0.3220  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3165  
Epoch 29/50  
504/504 [=====] - 0s 93us/step - loss: 0.3113  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3064  
Epoch 31/50  
504/504 [=====] - 0s 93us/step - loss: 0.3014  
Epoch 32/50  
504/504 [=====] - 0s 93us/step - loss: 0.2966  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.2924  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.2885  
Epoch 35/50  
504/504 [=====] - 0s 62us/step - loss: 0.2848  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.2811  
Epoch 37/50  
504/504 [=====] - 0s 93us/step - loss: 0.2776  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.2740  
Epoch 39/50  
504/504 [=====] - 0s 93us/step - loss: 0.2707  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.2680  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.2645  
Epoch 42/50  
504/504 [=====] - 0s 93us/step - loss: 0.2620  
Epoch 43/50  
504/504 [=====] - 0s 93us/step - loss: 0.2585  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.2550  
Epoch 45/50

504/504 [=====] - 0s 93us/step - loss: 0.2515  
 Epoch 46/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2483  
 Epoch 47/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2451  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2423  
 Epoch 49/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2387  
 Epoch 50/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2349  
 Epoch 1/50  
 504/504 [=====] - 3s 5ms/step - loss: 2.2331  
 Epoch 2/50  
 504/504 [=====] - 0s 62us/step - loss: 1.8888  
 Epoch 3/50  
 504/504 [=====] - 0s 93us/step - loss: 1.6135  
 Epoch 4/50  
 504/504 [=====] - 0s 93us/step - loss: 1.4093  
 Epoch 5/50  
 504/504 [=====] - 0s 62us/step - loss: 1.2286  
 Epoch 6/50  
 504/504 [=====] - 0s 93us/step - loss: 1.0955  
 Epoch 7/50  
 504/504 [=====] - 0s 93us/step - loss: 0.9794  
 Epoch 8/50  
 504/504 [=====] - 0s 62us/step - loss: 0.8833  
 Epoch 9/50  
 504/504 [=====] - 0s 93us/step - loss: 0.7993  
 Epoch 10/50  
 504/504 [=====] - 0s 93us/step - loss: 0.7312  
 Epoch 11/50  
 504/504 [=====] - 0s 62us/step - loss: 0.6688  
 Epoch 12/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6165  
 Epoch 13/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5727  
 Epoch 14/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5325  
 Epoch 15/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4996  
 Epoch 16/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4720  
 Epoch 17/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4491  
 Epoch 18/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4274  
 Epoch 19/50

504/504 [=====] - 0s 93us/step - loss: 0.4101  
Epoch 20/50  
504/504 [=====] - 0s 93us/step - loss: 0.3951  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.3819  
Epoch 22/50  
504/504 [=====] - 0s 93us/step - loss: 0.3714  
Epoch 23/50  
504/504 [=====] - 0s 93us/step - loss: 0.3618  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.3529  
Epoch 25/50  
504/504 [=====] - 0s 93us/step - loss: 0.3455  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3389  
Epoch 27/50  
504/504 [=====] - 0s 93us/step - loss: 0.3329  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3271  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3219  
Epoch 30/50  
504/504 [=====] - 0s 93us/step - loss: 0.3166  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.3125  
Epoch 32/50  
504/504 [=====] - 0s 93us/step - loss: 0.3077  
Epoch 33/50  
504/504 [=====] - 0s 62us/step - loss: 0.3040  
Epoch 34/50  
504/504 [=====] - 0s 93us/step - loss: 0.2996  
Epoch 35/50  
504/504 [=====] - 0s 93us/step - loss: 0.2957  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.2917  
Epoch 37/50  
504/504 [=====] - 0s 93us/step - loss: 0.2878  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.2844  
Epoch 39/50  
504/504 [=====] - 0s 93us/step - loss: 0.2809  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.2776  
Epoch 41/50  
504/504 [=====] - 0s 93us/step - loss: 0.2743  
Epoch 42/50  
504/504 [=====] - 0s 93us/step - loss: 0.2704  
Epoch 43/50

504/504 [=====] - 0s 62us/step - loss: 0.2670  
Epoch 44/50  
504/504 [=====] - 0s 93us/step - loss: 0.2628  
Epoch 45/50  
504/504 [=====] - 0s 62us/step - loss: 0.2590  
Epoch 46/50  
504/504 [=====] - 0s 93us/step - loss: 0.2548  
Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.2515  
Epoch 48/50  
504/504 [=====] - 0s 62us/step - loss: 0.2471  
Epoch 49/50  
504/504 [=====] - 0s 93us/step - loss: 0.2437  
Epoch 50/50  
504/504 [=====] - 0s 62us/step - loss: 0.2399  
Epoch 1/50  
504/504 [=====] - 3s 5ms/step - loss: 1.1081  
Epoch 2/50  
504/504 [=====] - 0s 62us/step - loss: 0.9578  
Epoch 3/50  
504/504 [=====] - 0s 93us/step - loss: 0.8560  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 0.7804  
Epoch 5/50  
504/504 [=====] - 0s 93us/step - loss: 0.7224  
Epoch 6/50  
504/504 [=====] - 0s 93us/step - loss: 0.6757  
Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 0.6368  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.6079  
Epoch 9/50  
504/504 [=====] - 0s 93us/step - loss: 0.5833  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.5638  
Epoch 11/50  
504/504 [=====] - 0s 93us/step - loss: 0.5483  
Epoch 12/50  
504/504 [=====] - 0s 93us/step - loss: 0.5364  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.5238  
Epoch 14/50  
504/504 [=====] - 0s 93us/step - loss: 0.5135  
Epoch 15/50  
504/504 [=====] - 0s 93us/step - loss: 0.5038  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4949  
Epoch 17/50

504/504 [=====] - 0s 93us/step - loss: 0.4866  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4795  
Epoch 19/50  
504/504 [=====] - 0s 93us/step - loss: 0.4731  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4655  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.4601  
Epoch 22/50  
504/504 [=====] - 0s 93us/step - loss: 0.4534  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.4473  
Epoch 24/50  
504/504 [=====] - 0s 93us/step - loss: 0.4427  
Epoch 25/50  
504/504 [=====] - 0s 93us/step - loss: 0.4366  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.4316  
Epoch 27/50  
504/504 [=====] - 0s 93us/step - loss: 0.4266  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.4216  
Epoch 29/50  
504/504 [=====] - 0s 93us/step - loss: 0.4167  
Epoch 30/50  
504/504 [=====] - 0s 93us/step - loss: 0.4112  
Epoch 31/50  
504/504 [=====] - 0s 62us/step - loss: 0.4064  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.4018  
Epoch 33/50  
504/504 [=====] - 0s 93us/step - loss: 0.3969  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3922  
Epoch 35/50  
504/504 [=====] - 0s 93us/step - loss: 0.3877  
Epoch 36/50  
504/504 [=====] - 0s 93us/step - loss: 0.3824  
Epoch 37/50  
504/504 [=====] - 0s 62us/step - loss: 0.3775  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.3727  
Epoch 39/50  
504/504 [=====] - 0s 93us/step - loss: 0.3676  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.3628  
Epoch 41/50

504/504 [=====] - 0s 93us/step - loss: 0.3576  
 Epoch 42/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3527  
 Epoch 43/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3474  
 Epoch 44/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3430  
 Epoch 45/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3377  
 Epoch 46/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3325  
 Epoch 47/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3271  
 Epoch 48/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3225  
 Epoch 49/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3182  
 Epoch 50/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3124  
 Epoch 1/50  
 504/504 [=====] - 3s 5ms/step - loss: 1.4005  
 Epoch 2/50  
 504/504 [=====] - 0s 93us/step - loss: 1.2618  
 Epoch 3/50  
 504/504 [=====] - 0s 62us/step - loss: 1.1418  
 Epoch 4/50  
 504/504 [=====] - 0s 93us/step - loss: 1.0496  
 Epoch 5/50  
 504/504 [=====] - 0s 93us/step - loss: 0.9744  
 Epoch 6/50  
 504/504 [=====] - 0s 62us/step - loss: 0.9060  
 Epoch 7/50  
 504/504 [=====] - 0s 93us/step - loss: 0.8505  
 Epoch 8/50  
 504/504 [=====] - 0s 93us/step - loss: 0.7998  
 Epoch 9/50  
 504/504 [=====] - 0s 93us/step - loss: 0.7557  
 Epoch 10/50  
 504/504 [=====] - 0s 62us/step - loss: 0.7183  
 Epoch 11/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6841  
 Epoch 12/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6536  
 Epoch 13/50  
 504/504 [=====] - 0s 62us/step - loss: 0.6265  
 Epoch 14/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6024  
 Epoch 15/50



504/504 [=====] - 0s 93us/step - loss: 0.5812  
 Epoch 16/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5614  
 Epoch 17/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5438  
 Epoch 18/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5282  
 Epoch 19/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5147  
 Epoch 20/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5027  
 Epoch 21/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4913  
 Epoch 22/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4814  
 Epoch 23/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4730  
 Epoch 24/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4647  
 Epoch 25/50  
 504/504 [=====] - 0s 63us/step - loss: 0.4576  
 Epoch 26/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4503  
 Epoch 27/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4435  
 Epoch 28/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4374  
 Epoch 29/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4314  
 Epoch 30/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4250  
 Epoch 31/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4197  
 Epoch 32/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4137  
 Epoch 33/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4078  
 Epoch 34/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4020  
 Epoch 35/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3963  
 Epoch 36/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3902  
 Epoch 37/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3848  
 Epoch 38/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3796  
 Epoch 39/50

504/504 [=====] - 0s 93us/step - loss: 0.3743  
Epoch 40/50  
504/504 [=====] - 0s 93us/step - loss: 0.3697  
Epoch 41/50  
504/504 [=====] - 0s 62us/step - loss: 0.3643  
Epoch 42/50  
504/504 [=====] - 0s 93us/step - loss: 0.3594  
Epoch 43/50  
504/504 [=====] - 0s 62us/step - loss: 0.3552  
Epoch 44/50  
504/504 [=====] - 0s 93us/step - loss: 0.3502  
Epoch 45/50  
504/504 [=====] - 0s 93us/step - loss: 0.3458  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.3417  
Epoch 47/50  
504/504 [=====] - 0s 62us/step - loss: 0.3377  
Epoch 48/50  
504/504 [=====] - 0s 93us/step - loss: 0.3333  
Epoch 49/50  
504/504 [=====] - 0s 62us/step - loss: 0.3293  
Epoch 50/50  
504/504 [=====] - 0s 62us/step - loss: 0.3257  
Epoch 1/50  
504/504 [=====] - 3s 5ms/step - loss: 1.1617  
Epoch 2/50  
504/504 [=====] - 0s 62us/step - loss: 1.0440  
Epoch 3/50  
504/504 [=====] - 0s 93us/step - loss: 0.9596  
Epoch 4/50  
504/504 [=====] - 0s 93us/step - loss: 0.8923  
Epoch 5/50  
504/504 [=====] - 0s 93us/step - loss: 0.8387  
Epoch 6/50  
504/504 [=====] - 0s 93us/step - loss: 0.7931  
Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 0.7514  
Epoch 8/50  
504/504 [=====] - 0s 93us/step - loss: 0.7119  
Epoch 9/50  
504/504 [=====] - 0s 93us/step - loss: 0.6771  
Epoch 10/50  
504/504 [=====] - 0s 93us/step - loss: 0.6409  
Epoch 11/50  
504/504 [=====] - 0s 93us/step - loss: 0.6066  
Epoch 12/50  
504/504 [=====] - 0s 93us/step - loss: 0.5722  
Epoch 13/50

504/504 [=====] - 0s 124us/step - loss: 0.5409  
 Epoch 14/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5117  
 Epoch 15/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4871  
 Epoch 16/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4672  
 Epoch 17/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4501  
 Epoch 18/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4365  
 Epoch 19/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4249  
 Epoch 20/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4155  
 Epoch 21/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4061  
 Epoch 22/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3980  
 Epoch 23/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3899  
 Epoch 24/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3833  
 Epoch 25/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3761  
 Epoch 26/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3701  
 Epoch 27/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3640  
 Epoch 28/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3583  
 Epoch 29/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3536  
 Epoch 30/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3475  
 Epoch 31/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3424  
 Epoch 32/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3369  
 Epoch 33/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3318  
 Epoch 34/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3268  
 Epoch 35/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3224  
 Epoch 36/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3174  
 Epoch 37/50

504/504 [=====] - 0s 62us/step - loss: 0.3124  
 Epoch 38/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3080  
 Epoch 39/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3040  
 Epoch 40/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2993  
 Epoch 41/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2949  
 Epoch 42/50  
 504/504 [=====] - 0s 88us/step - loss: 0.2907  
 Epoch 43/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2869  
 Epoch 44/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2827  
 Epoch 45/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2790  
 Epoch 46/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2767  
 Epoch 47/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2712  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2680  
 Epoch 49/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2647  
 Epoch 50/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2606  
 Epoch 1/50  
 504/504 [=====] - 3s 5ms/step - loss: 2.0664  
 Epoch 2/50  
 504/504 [=====] - 0s 62us/step - loss: 1.7908  
 Epoch 3/50  
 504/504 [=====] - 0s 93us/step - loss: 1.5587  
 Epoch 4/50  
 504/504 [=====] - 0s 62us/step - loss: 1.3763  
 Epoch 5/50  
 504/504 [=====] - 0s 62us/step - loss: 1.2284  
 Epoch 6/50  
 504/504 [=====] - 0s 93us/step - loss: 1.0989  
 Epoch 7/50  
 504/504 [=====] - 0s 62us/step - loss: 0.9943  
 Epoch 8/50  
 504/504 [=====] - 0s 62us/step - loss: 0.9032  
 Epoch 9/50  
 504/504 [=====] - 0s 62us/step - loss: 0.8279  
 Epoch 10/50  
 504/504 [=====] - 0s 62us/step - loss: 0.7602  
 Epoch 11/50

504/504 [=====] - 0s 66us/step - loss: 0.7022  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.6517  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.6085  
Epoch 14/50  
504/504 [=====] - 0s 93us/step - loss: 0.5720  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.5385  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.5105  
Epoch 17/50  
504/504 [=====] - 0s 93us/step - loss: 0.4846  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4626  
Epoch 19/50  
504/504 [=====] - 0s 93us/step - loss: 0.4443  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4273  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.4119  
Epoch 22/50  
504/504 [=====] - 0s 83us/step - loss: 0.3992  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.3876  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.3761  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.3668  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3568  
Epoch 27/50  
504/504 [=====] - 0s 62us/step - loss: 0.3467  
Epoch 28/50  
504/504 [=====] - 0s 93us/step - loss: 0.3380  
Epoch 29/50  
504/504 [=====] - 0s 93us/step - loss: 0.3306  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3227  
Epoch 31/50  
504/504 [=====] - 0s 93us/step - loss: 0.3157  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3095  
Epoch 33/50  
504/504 [=====] - 0s 93us/step - loss: 0.3034  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.2980  
Epoch 35/50

504/504 [=====] - 0s 93us/step - loss: 0.2928  
 Epoch 36/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2875  
 Epoch 37/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2826  
 Epoch 38/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2780  
 Epoch 39/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2732  
 Epoch 40/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2689  
 Epoch 41/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2649  
 Epoch 42/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2605  
 Epoch 43/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2575  
 Epoch 44/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2524  
 Epoch 45/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2486  
 Epoch 46/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2451  
 Epoch 47/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2415  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2384  
 Epoch 49/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2355  
 Epoch 50/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2326  
 Epoch 1/50  
 504/504 [=====] - 3s 6ms/step - loss: 1.9490  
 Epoch 2/50  
 504/504 [=====] - 0s 93us/step - loss: 1.7447  
 Epoch 3/50  
 504/504 [=====] - 0s 93us/step - loss: 1.5661  
 Epoch 4/50  
 504/504 [=====] - 0s 93us/step - loss: 1.4203  
 Epoch 5/50  
 504/504 [=====] - 0s 93us/step - loss: 1.2876  
 Epoch 6/50  
 504/504 [=====] - 0s 62us/step - loss: 1.1760  
 Epoch 7/50  
 504/504 [=====] - 0s 62us/step - loss: 1.0769  
 Epoch 8/50  
 504/504 [=====] - 0s 62us/step - loss: 0.9928  
 Epoch 9/50

504/504 [=====] - 0s 62us/step - loss: 0.9171  
 Epoch 10/50  
 504/504 [=====] - 0s 62us/step - loss: 0.8503  
 Epoch 11/50  
 504/504 [=====] - 0s 93us/step - loss: 0.7879  
 Epoch 12/50  
 504/504 [=====] - 0s 93us/step - loss: 0.7349  
 Epoch 13/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6893  
 Epoch 14/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6449  
 Epoch 15/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6106  
 Epoch 16/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5804  
 Epoch 17/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5564  
 Epoch 18/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5360  
 Epoch 19/50  
 504/504 [=====] - 0s 93us/step - loss: 0.5187  
 Epoch 20/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5054  
 Epoch 21/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4931  
 Epoch 22/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4832  
 Epoch 23/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4743  
 Epoch 24/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4659  
 Epoch 25/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4584  
 Epoch 26/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4522  
 Epoch 27/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4450  
 Epoch 28/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4377  
 Epoch 29/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4312  
 Epoch 30/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4246  
 Epoch 31/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4189  
 Epoch 32/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4122  
 Epoch 33/50

504/504 [=====] - 0s 62us/step - loss: 0.4063  
 Epoch 34/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3999  
 Epoch 35/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3942  
 Epoch 36/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3892  
 Epoch 37/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3831  
 Epoch 38/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3785  
 Epoch 39/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3732  
 Epoch 40/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3686  
 Epoch 41/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3634  
 Epoch 42/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3588  
 Epoch 43/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3541  
 Epoch 44/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3496  
 Epoch 45/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3459  
 Epoch 46/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3404  
 Epoch 47/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3371  
 Epoch 48/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3329  
 Epoch 49/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3286  
 Epoch 50/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3246  
 Epoch 1/50  
 504/504 [=====] - 3s 5ms/step - loss: 1.3624  
 Epoch 2/50  
 504/504 [=====] - 0s 62us/step - loss: 1.1903  
 Epoch 3/50  
 504/504 [=====] - 0s 62us/step - loss: 1.0524  
 Epoch 4/50  
 504/504 [=====] - 0s 93us/step - loss: 0.9434  
 Epoch 5/50  
 504/504 [=====] - 0s 62us/step - loss: 0.8546  
 Epoch 6/50  
 504/504 [=====] - 0s 62us/step - loss: 0.7803  
 Epoch 7/50



504/504 [=====] - 0s 62us/step - loss: 0.7180  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 0.6654  
Epoch 9/50  
504/504 [=====] - 0s 93us/step - loss: 0.6209  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.5842  
Epoch 11/50  
504/504 [=====] - 0s 76us/step - loss: 0.5549  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.5272  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.5057  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.4884  
Epoch 15/50  
504/504 [=====] - 0s 93us/step - loss: 0.4739  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4620  
Epoch 17/50  
504/504 [=====] - 0s 93us/step - loss: 0.4509  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4420  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.4340  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.4259  
Epoch 21/50  
504/504 [=====] - 0s 93us/step - loss: 0.4194  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.4129  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.4069  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.4004  
Epoch 25/50  
504/504 [=====] - 0s 93us/step - loss: 0.3941  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3885  
Epoch 27/50  
504/504 [=====] - 0s 93us/step - loss: 0.3820  
Epoch 28/50  
504/504 [=====] - 0s 93us/step - loss: 0.3761  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3691  
Epoch 30/50  
504/504 [=====] - 0s 93us/step - loss: 0.3628  
Epoch 31/50

504/504 [=====] - 0s 62us/step - loss: 0.3567  
 Epoch 32/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3509  
 Epoch 33/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3445  
 Epoch 34/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3388  
 Epoch 35/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3322  
 Epoch 36/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3263  
 Epoch 37/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3205  
 Epoch 38/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3153  
 Epoch 39/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3089  
 Epoch 40/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3040  
 Epoch 41/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2988  
 Epoch 42/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2939  
 Epoch 43/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2893  
 Epoch 44/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2848  
 Epoch 45/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2806  
 Epoch 46/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2762  
 Epoch 47/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2720  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2679  
 Epoch 49/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2638  
 Epoch 50/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2607  
 Epoch 1/50  
 504/504 [=====] - 3s 6ms/step - loss: 1.8512  
 Epoch 2/50  
 504/504 [=====] - 0s 62us/step - loss: 1.6632  
 Epoch 3/50  
 504/504 [=====] - 0s 93us/step - loss: 1.5058  
 Epoch 4/50  
 504/504 [=====] - 0s 62us/step - loss: 1.3775  
 Epoch 5/50

504/504 [=====] - 0s 62us/step - loss: 1.2677  
Epoch 6/50  
504/504 [=====] - 0s 93us/step - loss: 1.1723  
Epoch 7/50  
504/504 [=====] - 0s 62us/step - loss: 1.0936  
Epoch 8/50  
504/504 [=====] - 0s 93us/step - loss: 1.0197  
Epoch 9/50  
504/504 [=====] - 0s 62us/step - loss: 0.9563  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.9007  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 0.8495  
Epoch 12/50  
504/504 [=====] - 0s 62us/step - loss: 0.8022  
Epoch 13/50  
504/504 [=====] - 0s 93us/step - loss: 0.7606  
Epoch 14/50  
504/504 [=====] - 0s 62us/step - loss: 0.7246  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.6894  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.6570  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.6281  
Epoch 18/50  
504/504 [=====] - 0s 93us/step - loss: 0.6033  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.5796  
Epoch 20/50  
504/504 [=====] - 0s 93us/step - loss: 0.5610  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.5431  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.5256  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.5109  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.4968  
Epoch 25/50  
504/504 [=====] - 0s 93us/step - loss: 0.4848  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.4756  
Epoch 27/50  
504/504 [=====] - 0s 93us/step - loss: 0.4652  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.4591  
Epoch 29/50

```

504/504 [=====] - 0s 62us/step - loss: 0.4523
Epoch 30/50
504/504 [=====] - 0s 62us/step - loss: 0.4483
Epoch 31/50
504/504 [=====] - 0s 62us/step - loss: 0.4429
Epoch 32/50
504/504 [=====] - 0s 93us/step - loss: 0.4399
Epoch 33/50
504/504 [=====] - 0s 62us/step - loss: 0.4361
Epoch 34/50
504/504 [=====] - 0s 62us/step - loss: 0.4331
Epoch 35/50
504/504 [=====] - 0s 93us/step - loss: 0.4307
Epoch 36/50
504/504 [=====] - 0s 62us/step - loss: 0.4274
Epoch 37/50
504/504 [=====] - 0s 69us/step - loss: 0.4248
Epoch 38/50
504/504 [=====] - 0s 65us/step - loss: 0.4222
Epoch 39/50
504/504 [=====] - 0s 62us/step - loss: 0.4204
Epoch 40/50
504/504 [=====] - 0s 62us/step - loss: 0.4178
Epoch 41/50
504/504 [=====] - 0s 93us/step - loss: 0.4150
Epoch 42/50
504/504 [=====] - 0s 62us/step - loss: 0.4131
Epoch 43/50
504/504 [=====] - 0s 62us/step - loss: 0.4111
Epoch 44/50
504/504 [=====] - 0s 55us/step - loss: 0.4086
Epoch 45/50
504/504 [=====] - 0s 62us/step - loss: 0.4064
Epoch 46/50
504/504 [=====] - 0s 93us/step - loss: 0.4042
Epoch 47/50
504/504 [=====] - 0s 62us/step - loss: 0.4029
Epoch 48/50
504/504 [=====] - 0s 93us/step - loss: 0.4006
Epoch 49/50
504/504 [=====] - 0s 62us/step - loss: 0.3985
Epoch 50/50
504/504 [=====] - 0s 62us/step - loss: 0.3967
Epoch 1/50
504/504 [=====] - 3s 6ms/step - loss: 2.4115
Epoch 2/50
504/504 [=====] - 0s 62us/step - loss: 2.0834
Epoch 3/50

```

504/504 [=====] - 0s 93us/step - loss: 1.8149  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 1.6037  
Epoch 5/50  
504/504 [=====] - 0s 93us/step - loss: 1.4335  
Epoch 6/50  
504/504 [=====] - 0s 62us/step - loss: 1.2992  
Epoch 7/50  
504/504 [=====] - 0s 93us/step - loss: 1.1856  
Epoch 8/50  
504/504 [=====] - 0s 62us/step - loss: 1.0907  
Epoch 9/50  
504/504 [=====] - 0s 93us/step - loss: 1.0101  
Epoch 10/50  
504/504 [=====] - 0s 62us/step - loss: 0.9434  
Epoch 11/50  
504/504 [=====] - 0s 62us/step - loss: 0.8856  
Epoch 12/50  
504/504 [=====] - 0s 93us/step - loss: 0.8342  
Epoch 13/50  
504/504 [=====] - 0s 62us/step - loss: 0.7921  
Epoch 14/50  
504/504 [=====] - 0s 93us/step - loss: 0.7538  
Epoch 15/50  
504/504 [=====] - 0s 62us/step - loss: 0.7221  
Epoch 16/50  
504/504 [=====] - 0s 79us/step - loss: 0.6945  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.6706  
Epoch 18/50  
504/504 [=====] - 0s 93us/step - loss: 0.6479  
Epoch 19/50  
504/504 [=====] - 0s 62us/step - loss: 0.6294  
Epoch 20/50  
504/504 [=====] - 0s 93us/step - loss: 0.6123  
Epoch 21/50  
504/504 [=====] - 0s 62us/step - loss: 0.5967  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.5829  
Epoch 23/50  
504/504 [=====] - 0s 69us/step - loss: 0.5705  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.5589  
Epoch 25/50  
504/504 [=====] - 0s 62us/step - loss: 0.5495  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.5396  
Epoch 27/50

504/504 [=====] - 0s 93us/step - loss: 0.5311  
 Epoch 28/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5236  
 Epoch 29/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5157  
 Epoch 30/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5080  
 Epoch 31/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5018  
 Epoch 32/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4947  
 Epoch 33/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4874  
 Epoch 34/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4811  
 Epoch 35/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4737  
 Epoch 36/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4677  
 Epoch 37/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4605  
 Epoch 38/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4549  
 Epoch 39/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4489  
 Epoch 40/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4422  
 Epoch 41/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4360  
 Epoch 42/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4300  
 Epoch 43/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4236  
 Epoch 44/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4172  
 Epoch 45/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4112  
 Epoch 46/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4058  
 Epoch 47/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3996  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3938  
 Epoch 49/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3881  
 Epoch 50/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3831  
 Epoch 1/50

504/504 [=====] - 3s 6ms/step - loss: 1.3319  
Epoch 2/50  
504/504 [=====] - 0s 62us/step - loss: 1.1562  
Epoch 3/50  
504/504 [=====] - 0s 62us/step - loss: 1.0138  
Epoch 4/50  
504/504 [=====] - 0s 62us/step - loss: 0.9042  
Epoch 5/50  
504/504 [=====] - 0s 62us/step - loss: 0.8190  
Epoch 6/50  
504/504 [=====] - 0s 93us/step - loss: 0.7462  
Epoch 7/50  
504/504 [=====] - 0s 66us/step - loss: 0.6890  
Epoch 8/50  
504/504 [=====] - 0s 124us/step - loss: 0.6428  
Epoch 9/50  
504/504 [=====] - 0s 93us/step - loss: 0.6040  
Epoch 10/50  
504/504 [=====] - 0s 93us/step - loss: 0.5700  
Epoch 11/50  
504/504 [=====] - 0s 93us/step - loss: 0.5411  
Epoch 12/50  
504/504 [=====] - 0s 93us/step - loss: 0.5173  
Epoch 13/50  
504/504 [=====] - 0s 93us/step - loss: 0.4955  
Epoch 14/50  
504/504 [=====] - 0s 93us/step - loss: 0.4764  
Epoch 15/50  
504/504 [=====] - 0s 93us/step - loss: 0.4582  
Epoch 16/50  
504/504 [=====] - 0s 62us/step - loss: 0.4433  
Epoch 17/50  
504/504 [=====] - 0s 62us/step - loss: 0.4291  
Epoch 18/50  
504/504 [=====] - 0s 62us/step - loss: 0.4164  
Epoch 19/50  
504/504 [=====] - 0s 93us/step - loss: 0.4061  
Epoch 20/50  
504/504 [=====] - 0s 62us/step - loss: 0.3957  
Epoch 21/50  
504/504 [=====] - 0s 93us/step - loss: 0.3861  
Epoch 22/50  
504/504 [=====] - 0s 62us/step - loss: 0.3767  
Epoch 23/50  
504/504 [=====] - 0s 62us/step - loss: 0.3691  
Epoch 24/50  
504/504 [=====] - 0s 93us/step - loss: 0.3605  
Epoch 25/50

504/504 [=====] - 0s 62us/step - loss: 0.3521  
 Epoch 26/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3452  
 Epoch 27/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3370  
 Epoch 28/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3297  
 Epoch 29/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3231  
 Epoch 30/50  
 504/504 [=====] - 0s 65us/step - loss: 0.3168  
 Epoch 31/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3110  
 Epoch 32/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3057  
 Epoch 33/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3000  
 Epoch 34/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2944  
 Epoch 35/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2890  
 Epoch 36/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2842  
 Epoch 37/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2783  
 Epoch 38/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2740  
 Epoch 39/50  
 504/504 [=====] - 0s 51us/step - loss: 0.2691  
 Epoch 40/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2649  
 Epoch 41/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2606  
 Epoch 42/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2565  
 Epoch 43/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2533  
 Epoch 44/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2496  
 Epoch 45/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2464  
 Epoch 46/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2425  
 Epoch 47/50  
 504/504 [=====] - 0s 93us/step - loss: 0.2400  
 Epoch 48/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2380  
 Epoch 49/50



504/504 [=====] - 0s 62us/step - loss: 0.2338  
 Epoch 50/50  
 504/504 [=====] - 0s 62us/step - loss: 0.2314  
 Epoch 1/50  
 504/504 [=====] - 3s 6ms/step - loss: 1.3811  
 Epoch 2/50  
 504/504 [=====] - 0s 77us/step - loss: 1.2446  
 Epoch 3/50  
 504/504 [=====] - 0s 62us/step - loss: 1.1314  
 Epoch 4/50  
 504/504 [=====] - 0s 93us/step - loss: 1.0313  
 Epoch 5/50  
 504/504 [=====] - 0s 62us/step - loss: 0.9481  
 Epoch 6/50  
 504/504 [=====] - 0s 93us/step - loss: 0.8705  
 Epoch 7/50  
 504/504 [=====] - 0s 62us/step - loss: 0.8058  
 Epoch 8/50  
 504/504 [=====] - 0s 64us/step - loss: 0.7458  
 Epoch 9/50  
 504/504 [=====] - 0s 93us/step - loss: 0.6910  
 Epoch 10/50  
 504/504 [=====] - 0s 73us/step - loss: 0.6425  
 Epoch 11/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5982  
 Epoch 12/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5587  
 Epoch 13/50  
 504/504 [=====] - 0s 62us/step - loss: 0.5245  
 Epoch 14/50  
 504/504 [=====] - 0s 78us/step - loss: 0.4965  
 Epoch 15/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4709  
 Epoch 16/50  
 504/504 [=====] - 0s 80us/step - loss: 0.4518  
 Epoch 17/50  
 504/504 [=====] - 0s 68us/step - loss: 0.4354  
 Epoch 18/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4217  
 Epoch 19/50  
 504/504 [=====] - 0s 93us/step - loss: 0.4109  
 Epoch 20/50  
 504/504 [=====] - 0s 62us/step - loss: 0.4025  
 Epoch 21/50  
 504/504 [=====] - 0s 93us/step - loss: 0.3941  
 Epoch 22/50  
 504/504 [=====] - 0s 62us/step - loss: 0.3867  
 Epoch 23/50

504/504 [=====] - 0s 93us/step - loss: 0.3797  
Epoch 24/50  
504/504 [=====] - 0s 62us/step - loss: 0.3736  
Epoch 25/50  
504/504 [=====] - 0s 93us/step - loss: 0.3675  
Epoch 26/50  
504/504 [=====] - 0s 62us/step - loss: 0.3614  
Epoch 27/50  
504/504 [=====] - 0s 93us/step - loss: 0.3555  
Epoch 28/50  
504/504 [=====] - 0s 62us/step - loss: 0.3496  
Epoch 29/50  
504/504 [=====] - 0s 62us/step - loss: 0.3444  
Epoch 30/50  
504/504 [=====] - 0s 62us/step - loss: 0.3389  
Epoch 31/50  
504/504 [=====] - 0s 93us/step - loss: 0.3335  
Epoch 32/50  
504/504 [=====] - 0s 62us/step - loss: 0.3279  
Epoch 33/50  
504/504 [=====] - 0s 93us/step - loss: 0.3224  
Epoch 34/50  
504/504 [=====] - 0s 62us/step - loss: 0.3173  
Epoch 35/50  
504/504 [=====] - 0s 93us/step - loss: 0.3126  
Epoch 36/50  
504/504 [=====] - 0s 62us/step - loss: 0.3073  
Epoch 37/50  
504/504 [=====] - 0s 93us/step - loss: 0.3025  
Epoch 38/50  
504/504 [=====] - 0s 62us/step - loss: 0.2978  
Epoch 39/50  
504/504 [=====] - 0s 93us/step - loss: 0.2933  
Epoch 40/50  
504/504 [=====] - 0s 62us/step - loss: 0.2883  
Epoch 41/50  
504/504 [=====] - 0s 93us/step - loss: 0.2840  
Epoch 42/50  
504/504 [=====] - 0s 62us/step - loss: 0.2796  
Epoch 43/50  
504/504 [=====] - 0s 93us/step - loss: 0.2755  
Epoch 44/50  
504/504 [=====] - 0s 62us/step - loss: 0.2711  
Epoch 45/50  
504/504 [=====] - 0s 93us/step - loss: 0.2672  
Epoch 46/50  
504/504 [=====] - 0s 62us/step - loss: 0.2634  
Epoch 47/50

```

504/504 [=====] - 0s 93us/step - loss: 0.2599
Epoch 48/50
504/504 [=====] - 0s 62us/step - loss: 0.2565
Epoch 49/50
504/504 [=====] - 0s 93us/step - loss: 0.2530
Epoch 50/50
504/504 [=====] - 0s 62us/step - loss: 0.2490

```

```
[65]: print("A list of 50 Normalised mean squared errors:", m)
```

```

A list of 50 Normalised mean squared errors: [0.23717044493027045,
0.3170558239622138, 0.2754460956413129, 0.3462517157572966, 0.23972318307322002,
0.28190439066633194, 0.27622262183768087, 0.2798260422057461,
0.3740728580618338, 0.21242287775305507, 0.2785061128353886,
0.33670049658777707, 0.29962797380516826, 0.25109180507732926,
0.3699176332933834, 0.31619250555576695, 0.22639109754468445,
0.24049354173737347, 0.24196345443240416, 0.25668299858236515,
0.32077175920147766, 0.3131777659512746, 0.29670893429385964,
0.4183041533982353, 0.2991839488537066, 0.26627252530856804, 0.2663932549019409,
0.31658244601514124, 0.3941751099678576, 0.25655524538933777,
0.3037724533525338, 0.2603546177280282, 0.43066476866676906,
0.24742549180514284, 0.2597945867368457, 0.4423115901525381,
0.33609215605385956, 0.23234751929643288, 0.2605380017192491,
0.27164152573732764, 0.3136971012431222, 0.3823719975906767, 0.245295197568861,
0.2778508950355507, 0.3162780421404477, 0.2990994615278198, 0.45309670274707736,
0.36483907730760695, 0.22635153325891197, 0.2307035331925714]

```

How does the mean of the mean squared errors compare to that from Step A?

```
[66]: mnew = scaler.inverse_transform(m)
```

```
[67]: mnew
```

```

[67]: array([39.88058076, 41.23694601, 40.53045892, 41.73265992, 39.92392343,
40.64011361, 40.54364347, 40.60482556, 42.20503209, 39.46039449,
40.58241462, 41.57049079, 40.94104042, 40.11695004, 42.13448098,
41.22228782, 39.69755939, 39.93700327, 39.96196076, 40.21188231,
41.30003848, 41.17110088, 40.89147836, 42.95603049, 40.93350137,
40.37470185, 40.37675171, 41.22890858, 42.54634606, 40.2097132 ,
41.01140909, 40.27422234, 43.16590005, 40.0547001 , 40.26471363,
43.36365018, 41.56016185, 39.79869283, 40.27733599, 40.46586153,
41.17991862, 42.34594229, 40.01853006, 40.57128975, 41.22374014,
40.93206687, 43.54676944, 42.04825273, 39.69688763, 39.77077977])

```

```
[68]: sm = sum(mnew)
```

```
[69]: sm.mean()
```

```
[69]: 2046.6940445497864
```

The mean for normalised MSE is 2046.694. Compared to unnormalised MSE is 16844.64. The mean for normalised is much lower

### 0.0.10 C. Increase the number of epochs to 100

```
[70]: n = []

for i in range(1,51):
    X_train, X_test, y_train, y_test = \
    →train_test_split(X_train_scaled,y_train_scaled, test_size=0.3,\
    →random_state=0)
    model3 = baseline_model()
    model3.fit(X_train,y_train,epochs=100)
    y_pred = model3.predict(X_test)
    mse = mean_squared_error(y_test,y_pred)
    n.append(mse)
```

```
Epoch 1/100
504/504 [=====] - 3s 6ms/step - loss: 1.8141
Epoch 2/100
504/504 [=====] - 0s 124us/step - loss: 1.6149
Epoch 3/100
504/504 [=====] - 0s 124us/step - loss: 1.4426
Epoch 4/100
504/504 [=====] - 0s 124us/step - loss: 1.3157
Epoch 5/100
504/504 [=====] - 0s 155us/step - loss: 1.2038
Epoch 6/100
504/504 [=====] - 0s 124us/step - loss: 1.1160
Epoch 7/100
504/504 [=====] - 0s 125us/step - loss: 1.0372
Epoch 8/100
504/504 [=====] - 0s 124us/step - loss: 0.9707
Epoch 9/100
504/504 [=====] - 0s 93us/step - loss: 0.9119
Epoch 10/100
504/504 [=====] - 0s 93us/step - loss: 0.8581
Epoch 11/100
504/504 [=====] - 0s 124us/step - loss: 0.8092
Epoch 12/100
504/504 [=====] - 0s 93us/step - loss: 0.7623
Epoch 13/100
504/504 [=====] - 0s 124us/step - loss: 0.7154
Epoch 14/100
504/504 [=====] - 0s 124us/step - loss: 0.6711
Epoch 15/100
504/504 [=====] - 0s 124us/step - loss: 0.6305
Epoch 16/100
504/504 [=====] - 0s 124us/step - loss: 0.5917
Epoch 17/100
504/504 [=====] - 0s 124us/step - loss: 0.5591
```

Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.5296  
Epoch 19/100  
504/504 [=====] - 0s 155us/step - loss: 0.5043  
Epoch 20/100  
504/504 [=====] - 0s 124us/step - loss: 0.4824  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.4638  
Epoch 22/100  
504/504 [=====] - 0s 93us/step - loss: 0.4486  
Epoch 23/100  
504/504 [=====] - 0s 124us/step - loss: 0.4361  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.4245  
Epoch 25/100  
504/504 [=====] - 0s 124us/step - loss: 0.4149  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.4068  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.3995  
Epoch 28/100  
504/504 [=====] - 0s 124us/step - loss: 0.3925  
Epoch 29/100  
504/504 [=====] - 0s 124us/step - loss: 0.3860  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3799  
Epoch 31/100  
504/504 [=====] - 0s 124us/step - loss: 0.3753  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.3687  
Epoch 33/100  
504/504 [=====] - 0s 124us/step - loss: 0.3634  
Epoch 34/100  
504/504 [=====] - 0s 124us/step - loss: 0.3581  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.3545  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.3482  
Epoch 37/100  
504/504 [=====] - 0s 124us/step - loss: 0.3439  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3397  
Epoch 39/100  
504/504 [=====] - 0s 124us/step - loss: 0.3349  
Epoch 40/100  
504/504 [=====] - 0s 155us/step - loss: 0.3306  
Epoch 41/100  
504/504 [=====] - 0s 124us/step - loss: 0.3259

Epoch 42/100  
504/504 [=====] - 0s 124us/step - loss: 0.3216  
Epoch 43/100  
504/504 [=====] - 0s 124us/step - loss: 0.3173  
Epoch 44/100  
504/504 [=====] - 0s 124us/step - loss: 0.3131  
Epoch 45/100  
504/504 [=====] - 0s 124us/step - loss: 0.3088  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.3048  
Epoch 47/100  
504/504 [=====] - 0s 124us/step - loss: 0.3004  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2968  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2924  
Epoch 50/100  
504/504 [=====] - 0s 124us/step - loss: 0.2889  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.2854  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.2816  
Epoch 53/100  
504/504 [=====] - 0s 124us/step - loss: 0.2785  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2755  
Epoch 55/100  
504/504 [=====] - 0s 124us/step - loss: 0.2717  
Epoch 56/100  
504/504 [=====] - 0s 62us/step - loss: 0.2687  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2659  
Epoch 58/100  
504/504 [=====] - 0s 95us/step - loss: 0.2625  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2596  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2571  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.2543  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2524  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2493  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2475  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2449

Epoch 66/100  
504/504 [=====] - 0s 62us/step - loss: 0.2433  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2410  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2392  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2369  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2349  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2330  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.2314  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2292  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.2280  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.2257  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.2236  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.2217  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.2198  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.2182  
Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.2162  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.2141  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.2120  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.2099  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.2080  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.2063  
Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.2048  
Epoch 87/100  
504/504 [=====] - 0s 93us/step - loss: 0.2027  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.2020  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.1998

```

Epoch 90/100
504/504 [=====] - 0s 93us/step - loss: 0.1989
Epoch 91/100
504/504 [=====] - 0s 93us/step - loss: 0.1971
Epoch 92/100
504/504 [=====] - 0s 124us/step - loss: 0.1961
Epoch 93/100
504/504 [=====] - 0s 93us/step - loss: 0.1947
Epoch 94/100
504/504 [=====] - 0s 93us/step - loss: 0.1933
Epoch 95/100
504/504 [=====] - 0s 93us/step - loss: 0.1925
Epoch 96/100
504/504 [=====] - 0s 93us/step - loss: 0.1909
Epoch 97/100
504/504 [=====] - 0s 93us/step - loss: 0.1896
Epoch 98/100
504/504 [=====] - 0s 93us/step - loss: 0.1890
Epoch 99/100
504/504 [=====] - 0s 93us/step - loss: 0.1882
Epoch 100/100
504/504 [=====] - 0s 93us/step - loss: 0.1874
Epoch 1/100
504/504 [=====] - 3s 6ms/step - loss: 1.0357
Epoch 2/100
504/504 [=====] - 0s 93us/step - loss: 0.9008
Epoch 3/100
504/504 [=====] - 0s 93us/step - loss: 0.7983
Epoch 4/100
504/504 [=====] - 0s 93us/step - loss: 0.7168
Epoch 5/100
504/504 [=====] - 0s 93us/step - loss: 0.6621
Epoch 6/100
504/504 [=====] - 0s 93us/step - loss: 0.6177
Epoch 7/100
504/504 [=====] - 0s 62us/step - loss: 0.5814
Epoch 8/100
504/504 [=====] - 0s 93us/step - loss: 0.5546
Epoch 9/100
504/504 [=====] - 0s 93us/step - loss: 0.5311
Epoch 10/100
504/504 [=====] - 0s 93us/step - loss: 0.5129
Epoch 11/100
504/504 [=====] - 0s 93us/step - loss: 0.4965
Epoch 12/100
504/504 [=====] - 0s 62us/step - loss: 0.4817
Epoch 13/100
504/504 [=====] - 0s 62us/step - loss: 0.4680

```



Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.4567  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.4474  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.4369  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.4284  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.4193  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.4117  
Epoch 20/100  
504/504 [=====] - ETA: 0s - loss: 0.426 - 0s 93us/step  
- loss: 0.4046  
Epoch 21/100  
504/504 [=====] - 0s 62us/step - loss: 0.3972  
Epoch 22/100  
504/504 [=====] - 0s 62us/step - loss: 0.3902  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.3837  
Epoch 24/100  
504/504 [=====] - 0s 62us/step - loss: 0.3779  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.3714  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.3649  
Epoch 27/100  
504/504 [=====] - 0s 62us/step - loss: 0.3600  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.3532  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3482  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3428  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3380  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.3327  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3277  
Epoch 34/100  
504/504 [=====] - 0s 62us/step - loss: 0.3236  
Epoch 35/100  
504/504 [=====] - 0s 62us/step - loss: 0.3187  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.3148  
Epoch 37/100

504/504 [=====] - 0s 93us/step - loss: 0.3103  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3050  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3004  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.2967  
Epoch 41/100  
504/504 [=====] - 0s 62us/step - loss: 0.2917  
Epoch 42/100  
504/504 [=====] - 0s 62us/step - loss: 0.2884  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.2840  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.2799  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.2766  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.2722  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.2684  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2649  
Epoch 49/100  
504/504 [=====] - 0s 62us/step - loss: 0.2612  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2571  
Epoch 51/100  
504/504 [=====] - 0s 62us/step - loss: 0.2537  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.2511  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2476  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2449  
Epoch 55/100  
504/504 [=====] - 0s 62us/step - loss: 0.2422  
Epoch 56/100  
504/504 [=====] - 0s 62us/step - loss: 0.2393  
Epoch 57/100  
504/504 [=====] - 0s 62us/step - loss: 0.2368  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2337  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2317  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2287  
Epoch 61/100

504/504 [=====] - 0s 93us/step - loss: 0.2263  
Epoch 62/100  
504/504 [=====] - 0s 62us/step - loss: 0.2238  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2220  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2195  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2180  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2154  
Epoch 67/100  
504/504 [=====] - 0s 62us/step - loss: 0.2135  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2122  
Epoch 69/100  
504/504 [=====] - 0s 62us/step - loss: 0.2090  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2076  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2056  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.2035  
Epoch 73/100  
504/504 [=====] - 0s 62us/step - loss: 0.2033  
Epoch 74/100  
504/504 [=====] - 0s 62us/step - loss: 0.2005  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.1984  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.1966  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.1950  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.1936  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.1916  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.1900  
Epoch 81/100  
504/504 [=====] - 0s 62us/step - loss: 0.1884  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.1867  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.1849  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.1836  
Epoch 85/100

504/504 [=====] - 0s 93us/step - loss: 0.1823  
 Epoch 86/100  
 504/504 [=====] - 0s 62us/step - loss: 0.1813  
 Epoch 87/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1796  
 Epoch 88/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1783  
 Epoch 89/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1774  
 Epoch 90/100  
 504/504 [=====] - ETA: 0s - loss: 0.273 - 0s 62us/step  
 - loss: 0.1765  
 Epoch 91/100  
 504/504 [=====] - 0s 62us/step - loss: 0.1752  
 Epoch 92/100  
 504/504 [=====] - 0s 62us/step - loss: 0.1737  
 Epoch 93/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1727  
 Epoch 94/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1719  
 Epoch 95/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1707  
 Epoch 96/100  
 504/504 [=====] - 0s 62us/step - loss: 0.1696  
 Epoch 97/100  
 504/504 [=====] - 0s 62us/step - loss: 0.1689  
 Epoch 98/100  
 504/504 [=====] - 0s 62us/step - loss: 0.1678  
 Epoch 99/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1671  
 Epoch 100/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1660  
 Epoch 1/100  
 504/504 [=====] - 3s 6ms/step - loss: 2.4293  
 Epoch 2/100  
 504/504 [=====] - 0s 62us/step - loss: 2.0952  
 Epoch 3/100  
 504/504 [=====] - 0s 62us/step - loss: 1.8055  
 Epoch 4/100  
 504/504 [=====] - 0s 93us/step - loss: 1.5779  
 Epoch 5/100  
 504/504 [=====] - 0s 93us/step - loss: 1.3812  
 Epoch 6/100  
 504/504 [=====] - 0s 93us/step - loss: 1.2115  
 Epoch 7/100  
 504/504 [=====] - 0s 93us/step - loss: 1.0686  
 Epoch 8/100  
 504/504 [=====] - 0s 93us/step - loss: 0.9466

Epoch 9/100  
504/504 [=====] - 0s 93us/step - loss: 0.8445  
Epoch 10/100  
504/504 [=====] - 0s 93us/step - loss: 0.7516  
Epoch 11/100  
504/504 [=====] - 0s 62us/step - loss: 0.6810  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 0.6147  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.5647  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.5261  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.4952  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.4707  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.4519  
Epoch 18/100  
504/504 [=====] - 0s 62us/step - loss: 0.4386  
Epoch 19/100  
504/504 [=====] - 0s 62us/step - loss: 0.4276  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.4184  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.4108  
Epoch 22/100  
504/504 [=====] - 0s 93us/step - loss: 0.4040  
Epoch 23/100  
504/504 [=====] - 0s 62us/step - loss: 0.3983  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.3927  
Epoch 25/100  
504/504 [=====] - 0s 62us/step - loss: 0.3873  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.3823  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.3775  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.3723  
Epoch 29/100  
504/504 [=====] - 0s 62us/step - loss: 0.3669  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3622  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3575  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.3526

Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3469  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.3421  
Epoch 35/100  
504/504 [=====] - 0s 62us/step - loss: 0.3364  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.3320  
Epoch 37/100  
504/504 [=====] - 0s 62us/step - loss: 0.3272  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3222  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3176  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.3130  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.3079  
Epoch 42/100  
504/504 [=====] - 0s 62us/step - loss: 0.3037  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.2989  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.2938  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.2895  
Epoch 46/100  
504/504 [=====] - 0s 62us/step - loss: 0.2850  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.2806  
Epoch 48/100  
504/504 [=====] - 0s 62us/step - loss: 0.2762  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2720  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2680  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2643  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.2599  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2565  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2523  
Epoch 55/100  
504/504 [=====] - 0s 62us/step - loss: 0.2489  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2452

Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2418  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2390  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2359  
Epoch 60/100  
504/504 [=====] - 0s 62us/step - loss: 0.2329  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2305  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2281  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2256  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2229  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2206  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2192  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2161  
Epoch 68/100  
504/504 [=====] - 0s 62us/step - loss: 0.2149  
Epoch 69/100  
504/504 [=====] - 0s 62us/step - loss: 0.2132  
Epoch 70/100  
504/504 [=====] - 0s 62us/step - loss: 0.2105  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2089  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.2076  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2054  
Epoch 74/100  
504/504 [=====] - 0s 62us/step - loss: 0.2040  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.2029  
Epoch 76/100  
504/504 [=====] - 0s 62us/step - loss: 0.2020  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.2014  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.1990  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.1978  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.1969

Epoch 81/100  
504/504 [=====] - 0s 62us/step - loss: 0.1955  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.1940  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.1933  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.1919  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.1912  
Epoch 86/100  
504/504 [=====] - 0s 62us/step - loss: 0.1906  
Epoch 87/100  
504/504 [=====] - 0s 62us/step - loss: 0.1892  
Epoch 88/100  
504/504 [=====] - 0s 62us/step - loss: 0.1879  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.1876  
Epoch 90/100  
504/504 [=====] - 0s 93us/step - loss: 0.1871  
Epoch 91/100  
504/504 [=====] - 0s 93us/step - loss: 0.1860  
Epoch 92/100  
504/504 [=====] - 0s 62us/step - loss: 0.1851  
Epoch 93/100  
504/504 [=====] - 0s 93us/step - loss: 0.1841  
Epoch 94/100  
504/504 [=====] - 0s 62us/step - loss: 0.1832  
Epoch 95/100  
504/504 [=====] - 0s 93us/step - loss: 0.1824  
Epoch 96/100  
504/504 [=====] - 0s 62us/step - loss: 0.1820  
Epoch 97/100  
504/504 [=====] - 0s 62us/step - loss: 0.1813  
Epoch 98/100  
504/504 [=====] - 0s 93us/step - loss: 0.1802  
Epoch 99/100  
504/504 [=====] - 0s 93us/step - loss: 0.1798  
Epoch 100/100  
504/504 [=====] - 0s 93us/step - loss: 0.1795  
Epoch 1/100  
504/504 [=====] - 3s 6ms/step - loss: 1.4751  
Epoch 2/100  
504/504 [=====] - 0s 93us/step - loss: 1.2829  
Epoch 3/100  
504/504 [=====] - 0s 93us/step - loss: 1.1238  
Epoch 4/100  
504/504 [=====] - 0s 93us/step - loss: 1.0053



Epoch 5/100  
504/504 [=====] - 0s 93us/step - loss: 0.9089  
Epoch 6/100  
504/504 [=====] - 0s 93us/step - loss: 0.8308  
Epoch 7/100  
504/504 [=====] - 0s 93us/step - loss: 0.7674  
Epoch 8/100  
504/504 [=====] - 0s 93us/step - loss: 0.7186  
Epoch 9/100  
504/504 [=====] - 0s 62us/step - loss: 0.6774  
Epoch 10/100  
504/504 [=====] - 0s 93us/step - loss: 0.6466  
Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 0.6193  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 0.5974  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.5784  
Epoch 14/100  
504/504 [=====] - 0s 124us/step - loss: 0.5616  
Epoch 15/100  
504/504 [=====] - 0s 62us/step - loss: 0.5478  
Epoch 16/100  
504/504 [=====] - 0s 62us/step - loss: 0.5342  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.5220  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.5104  
Epoch 19/100  
504/504 [=====] - 0s 62us/step - loss: 0.5005  
Epoch 20/100  
504/504 [=====] - 0s 62us/step - loss: 0.4898  
Epoch 21/100  
504/504 [=====] - 0s 62us/step - loss: 0.4799  
Epoch 22/100  
504/504 [=====] - 0s 62us/step - loss: 0.4706  
Epoch 23/100  
504/504 [=====] - 0s 62us/step - loss: 0.4615  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.4531  
Epoch 25/100  
504/504 [=====] - 0s 62us/step - loss: 0.4440  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.4367  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.4292  
Epoch 28/100  
504/504 [=====] - 0s 62us/step - loss: 0.4216

Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.4142  
Epoch 30/100  
504/504 [=====] - 0s 62us/step - loss: 0.4076  
Epoch 31/100  
504/504 [=====] - 0s 62us/step - loss: 0.3999  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.3938  
Epoch 33/100  
504/504 [=====] - 0s 62us/step - loss: 0.3876  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.3822  
Epoch 35/100  
504/504 [=====] - 0s 62us/step - loss: 0.3748  
Epoch 36/100  
504/504 [=====] - 0s 62us/step - loss: 0.3690  
Epoch 37/100  
504/504 [=====] - 0s 47us/step - loss: 0.3637  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3581  
Epoch 39/100  
504/504 [=====] - 0s 62us/step - loss: 0.3533  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.3469  
Epoch 41/100  
504/504 [=====] - 0s 62us/step - loss: 0.3412  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.3356  
Epoch 43/100  
504/504 [=====] - 0s 62us/step - loss: 0.3303  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.3245  
Epoch 45/100  
504/504 [=====] - 0s 72us/step - loss: 0.3192  
Epoch 46/100  
504/504 [=====] - 0s 155us/step - loss: 0.3144  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.3093  
Epoch 48/100  
504/504 [=====] - 0s 62us/step - loss: 0.3037  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2992  
Epoch 50/100  
504/504 [=====] - 0s 62us/step - loss: 0.2946  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2903  
Epoch 52/100  
504/504 [=====] - 0s 62us/step - loss: 0.2856

Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2807  
Epoch 54/100  
504/504 [=====] - 0s 62us/step - loss: 0.2766  
Epoch 55/100  
504/504 [=====] - 0s 62us/step - loss: 0.2732  
Epoch 56/100  
504/504 [=====] - 0s 62us/step - loss: 0.2687  
Epoch 57/100  
504/504 [=====] - 0s 62us/step - loss: 0.2647  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2610  
Epoch 59/100  
504/504 [=====] - 0s 62us/step - loss: 0.2564  
Epoch 60/100  
504/504 [=====] - 0s 62us/step - loss: 0.2533  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2499  
Epoch 62/100  
504/504 [=====] - 0s 62us/step - loss: 0.2466  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2430  
Epoch 64/100  
504/504 [=====] - 0s 62us/step - loss: 0.2398  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2369  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2345  
Epoch 67/100  
504/504 [=====] - 0s 62us/step - loss: 0.2311  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2279  
Epoch 69/100  
504/504 [=====] - 0s 62us/step - loss: 0.2257  
Epoch 70/100  
504/504 [=====] - 0s 62us/step - loss: 0.2223  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2202  
Epoch 72/100  
504/504 [=====] - 0s 62us/step - loss: 0.2177  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2154  
Epoch 74/100  
504/504 [=====] - 0s 62us/step - loss: 0.2132  
Epoch 75/100  
504/504 [=====] - 0s 62us/step - loss: 0.2107  
Epoch 76/100  
504/504 [=====] - 0s 62us/step - loss: 0.2083

Epoch 77/100  
504/504 [=====] - 0s 63us/step - loss: 0.2064  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.2047  
Epoch 79/100  
504/504 [=====] - 0s 62us/step - loss: 0.2030  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.2013  
Epoch 81/100  
504/504 [=====] - 0s 62us/step - loss: 0.1997  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.1976  
Epoch 83/100  
504/504 [=====] - 0s 62us/step - loss: 0.1959  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.1953  
Epoch 85/100  
504/504 [=====] - 0s 62us/step - loss: 0.1938  
Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.1915  
Epoch 87/100  
504/504 [=====] - 0s 62us/step - loss: 0.1906  
Epoch 88/100  
504/504 [=====] - 0s 62us/step - loss: 0.1895  
Epoch 89/100  
504/504 [=====] - 0s 62us/step - loss: 0.1878  
Epoch 90/100  
504/504 [=====] - 0s 93us/step - loss: 0.1868  
Epoch 91/100  
504/504 [=====] - 0s 62us/step - loss: 0.1852  
Epoch 92/100  
504/504 [=====] - 0s 93us/step - loss: 0.1837  
Epoch 93/100  
504/504 [=====] - 0s 62us/step - loss: 0.1829  
Epoch 94/100  
504/504 [=====] - 0s 93us/step - loss: 0.1811  
Epoch 95/100  
504/504 [=====] - 0s 62us/step - loss: 0.1807  
Epoch 96/100  
504/504 [=====] - 0s 62us/step - loss: 0.1794  
Epoch 97/100  
504/504 [=====] - 0s 62us/step - loss: 0.1780  
Epoch 98/100  
504/504 [=====] - 0s 62us/step - loss: 0.1773  
Epoch 99/100  
504/504 [=====] - 0s 93us/step - loss: 0.1761  
Epoch 100/100  
504/504 [=====] - 0s 85us/step - loss: 0.1750

Epoch 1/100  
504/504 [=====] - 3s 7ms/step - loss: 2.0110  
Epoch 2/100  
504/504 [=====] - 0s 93us/step - loss: 1.6905  
Epoch 3/100  
504/504 [=====] - 0s 102us/step - loss: 1.4427  
Epoch 4/100  
504/504 [=====] - 0s 80us/step - loss: 1.2461  
Epoch 5/100  
504/504 [=====] - 0s 79us/step - loss: 1.1035  
Epoch 6/100  
504/504 [=====] - 0s 79us/step - loss: 0.9858  
Epoch 7/100  
504/504 [=====] - 0s 79us/step - loss: 0.8941  
Epoch 8/100  
504/504 [=====] - 0s 59us/step - loss: 0.8162  
Epoch 9/100  
504/504 [=====] - 0s 79us/step - loss: 0.7542  
Epoch 10/100  
504/504 [=====] - 0s 80us/step - loss: 0.6989  
Epoch 11/100  
504/504 [=====] - 0s 79us/step - loss: 0.6522  
Epoch 12/100  
504/504 [=====] - 0s 179us/step - loss: 0.6117  
Epoch 13/100  
504/504 [=====] - 0s 123us/step - loss: 0.5775  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.5474  
Epoch 15/100  
504/504 [=====] - 0s 124us/step - loss: 0.5208  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.4978  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.4779  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.4597  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.4437  
Epoch 20/100  
504/504 [=====] - 0s 124us/step - loss: 0.4299  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.4169  
Epoch 22/100  
504/504 [=====] - 0s 93us/step - loss: 0.4051  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.3951  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.3858

Epoch 25/100  
504/504 [=====] - 0s 124us/step - loss: 0.3767  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.3692  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.3610  
Epoch 28/100  
504/504 [=====] - 0s 124us/step - loss: 0.3537  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3469  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3405  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3346  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.3286  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3227  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.3180  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.3125  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.3085  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3034  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.2986  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.2942  
Epoch 40/100  
504/504 [=====] - 0s 124us/step - loss: 0.2903  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.2853  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.2818  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.2781  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.2747  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.2714  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.2689  
Epoch 47/100  
504/504 [=====] - 0s 124us/step - loss: 0.2660  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2636

Epoch 49/100  
504/504 [=====] - 0s 124us/step - loss: 0.2603  
Epoch 50/100  
504/504 [=====] - 0s 62us/step - loss: 0.2582  
Epoch 51/100  
504/504 [=====] - 0s 62us/step - loss: 0.2562  
Epoch 52/100  
504/504 [=====] - 0s 62us/step - loss: 0.2538  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2518  
Epoch 54/100  
504/504 [=====] - 0s 62us/step - loss: 0.2501  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2477  
Epoch 56/100  
504/504 [=====] - 0s 62us/step - loss: 0.2461  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2442  
Epoch 58/100  
504/504 [=====] - 0s 62us/step - loss: 0.2428  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2408  
Epoch 60/100  
504/504 [=====] - 0s 62us/step - loss: 0.2392  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2372  
Epoch 62/100  
504/504 [=====] - 0s 62us/step - loss: 0.2355  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2336  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2324  
Epoch 65/100  
504/504 [=====] - 0s 62us/step - loss: 0.2314  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2293  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2281  
Epoch 68/100  
504/504 [=====] - 0s 62us/step - loss: 0.2267  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2250  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2242  
Epoch 71/100  
504/504 [=====] - 0s 62us/step - loss: 0.2224  
Epoch 72/100  
504/504 [=====] - 0s 186us/step - loss: 0.2211

Epoch 73/100  
504/504 [=====] - 0s 124us/step - loss: 0.2202  
Epoch 74/100  
504/504 [=====] - 0s 62us/step - loss: 0.2187  
Epoch 75/100  
504/504 [=====] - 0s 62us/step - loss: 0.2172  
Epoch 76/100  
504/504 [=====] - 0s 62us/step - loss: 0.2164  
Epoch 77/100  
504/504 [=====] - 0s 62us/step - loss: 0.2143  
Epoch 78/100  
504/504 [=====] - 0s 62us/step - loss: 0.2137  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.2120  
Epoch 80/100  
504/504 [=====] - 0s 62us/step - loss: 0.2112  
Epoch 81/100  
504/504 [=====] - 0s 62us/step - loss: 0.2102  
Epoch 82/100  
504/504 [=====] - 0s 62us/step - loss: 0.2086  
Epoch 83/100  
504/504 [=====] - 0s 62us/step - loss: 0.2076  
Epoch 84/100  
504/504 [=====] - 0s 62us/step - loss: 0.2061  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.2056  
Epoch 86/100  
504/504 [=====] - 0s 62us/step - loss: 0.2041  
Epoch 87/100  
504/504 [=====] - 0s 56us/step - loss: 0.2034  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.2021  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.2009  
Epoch 90/100  
504/504 [=====] - 0s 62us/step - loss: 0.1996  
Epoch 91/100  
504/504 [=====] - 0s 93us/step - loss: 0.1987  
Epoch 92/100  
504/504 [=====] - 0s 93us/step - loss: 0.1973  
Epoch 93/100  
504/504 [=====] - 0s 62us/step - loss: 0.1963  
Epoch 94/100  
504/504 [=====] - 0s 62us/step - loss: 0.1956  
Epoch 95/100  
504/504 [=====] - 0s 93us/step - loss: 0.1943  
Epoch 96/100  
504/504 [=====] - 0s 62us/step - loss: 0.1936



Epoch 97/100  
504/504 [=====] - 0s 62us/step - loss: 0.1918  
Epoch 98/100  
504/504 [=====] - 0s 62us/step - loss: 0.1910  
Epoch 99/100  
504/504 [=====] - 0s 93us/step - loss: 0.1890  
Epoch 100/100  
504/504 [=====] - 0s 93us/step - loss: 0.1885  
Epoch 1/100  
504/504 [=====] - 4s 8ms/step - loss: 0.9983  
Epoch 2/100  
504/504 [=====] - 0s 186us/step - loss: 0.8859  
Epoch 3/100  
504/504 [=====] - 0s 155us/step - loss: 0.7989  
Epoch 4/100  
504/504 [=====] - 0s 124us/step - loss: 0.7389  
Epoch 5/100  
504/504 [=====] - 0s 124us/step - loss: 0.6883  
Epoch 6/100  
504/504 [=====] - 0s 93us/step - loss: 0.6512  
Epoch 7/100  
504/504 [=====] - 0s 93us/step - loss: 0.6182  
Epoch 8/100  
504/504 [=====] - 0s 93us/step - loss: 0.5917  
Epoch 9/100  
504/504 [=====] - 0s 186us/step - loss: 0.5681  
Epoch 10/100  
504/504 [=====] - 0s 124us/step - loss: 0.5483  
Epoch 11/100  
504/504 [=====] - 0s 124us/step - loss: 0.5296  
Epoch 12/100  
504/504 [=====] - 0s 124us/step - loss: 0.5145  
Epoch 13/100  
504/504 [=====] - 0s 124us/step - loss: 0.4997  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.4870  
Epoch 15/100  
504/504 [=====] - 0s 124us/step - loss: 0.4748  
Epoch 16/100  
504/504 [=====] - 0s 124us/step - loss: 0.4632  
Epoch 17/100  
504/504 [=====] - 0s 124us/step - loss: 0.4528  
Epoch 18/100  
504/504 [=====] - 0s 124us/step - loss: 0.4425  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.4330  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.4241

Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.4163  
Epoch 22/100  
504/504 [=====] - 0s 93us/step - loss: 0.4065  
Epoch 23/100  
504/504 [=====] - 0s 124us/step - loss: 0.3980  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.3902  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.3828  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.3755  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.3681  
Epoch 28/100  
504/504 [=====] - 0s 124us/step - loss: 0.3614  
Epoch 29/100  
504/504 [=====] - 0s 124us/step - loss: 0.3555  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3489  
Epoch 31/100  
504/504 [=====] - 0s 124us/step - loss: 0.3426  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.3368  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3314  
Epoch 34/100  
504/504 [=====] - 0s 124us/step - loss: 0.3261  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.3208  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.3161  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3117  
Epoch 38/100  
504/504 [=====] - 0s 124us/step - loss: 0.3071  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3024  
Epoch 40/100  
504/504 [=====] - 0s 124us/step - loss: 0.2984  
Epoch 41/100  
504/504 [=====] - 0s 124us/step - loss: 0.2946  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.2908  
Epoch 43/100  
504/504 [=====] - 0s 124us/step - loss: 0.2872  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.2845

Epoch 45/100  
504/504 [=====] - 0s 124us/step - loss: 0.2810  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.2780  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.2749  
Epoch 48/100  
504/504 [=====] - 0s 124us/step - loss: 0.2722  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2690  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2666  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.2637  
Epoch 52/100  
504/504 [=====] - 0s 94us/step - loss: 0.2612  
Epoch 53/100  
504/504 [=====] - 0s 124us/step - loss: 0.2592  
Epoch 54/100  
504/504 [=====] - 0s 124us/step - loss: 0.2569  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2545  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2519  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2492  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2469  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2446  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2426  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2403  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2385  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2364  
Epoch 64/100  
504/504 [=====] - 0s 155us/step - loss: 0.2349  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2323  
Epoch 66/100  
504/504 [=====] - 0s 124us/step - loss: 0.2297  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.2281  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2261

Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2242  
Epoch 70/100  
504/504 [=====] - 0s 124us/step - loss: 0.2225  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2205  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.2187  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2179  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.2155  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.2142  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.2126  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.2112  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.2099  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.2087  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.2075  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.2051  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.2041  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.2025  
Epoch 84/100  
504/504 [=====] - 0s 124us/step - loss: 0.2012  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.2001  
Epoch 86/100  
504/504 [=====] - 0s 124us/step - loss: 0.1992  
Epoch 87/100  
504/504 [=====] - 0s 93us/step - loss: 0.1980  
Epoch 88/100  
504/504 [=====] - 0s 124us/step - loss: 0.1967  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.1953  
Epoch 90/100  
504/504 [=====] - 0s 93us/step - loss: 0.1943  
Epoch 91/100  
504/504 [=====] - 0s 124us/step - loss: 0.1934  
Epoch 92/100  
504/504 [=====] - 0s 124us/step - loss: 0.1924

Epoch 93/100  
504/504 [=====] - 0s 93us/step - loss: 0.1914  
Epoch 94/100  
504/504 [=====] - 0s 93us/step - loss: 0.1907  
Epoch 95/100  
504/504 [=====] - 0s 124us/step - loss: 0.1899  
Epoch 96/100  
504/504 [=====] - 0s 93us/step - loss: 0.1885  
Epoch 97/100  
504/504 [=====] - 0s 124us/step - loss: 0.1882  
Epoch 98/100  
504/504 [=====] - 0s 93us/step - loss: 0.1867  
Epoch 99/100  
504/504 [=====] - 0s 124us/step - loss: 0.1864  
Epoch 100/100  
504/504 [=====] - 0s 124us/step - loss: 0.1855  
Epoch 1/100  
504/504 [=====] - 4s 8ms/step - loss: 1.3434  
Epoch 2/100  
504/504 [=====] - 0s 124us/step - loss: 1.1895  
Epoch 3/100  
504/504 [=====] - 0s 93us/step - loss: 1.0707  
Epoch 4/100  
504/504 [=====] - 0s 124us/step - loss: 0.9819  
Epoch 5/100  
504/504 [=====] - 0s 93us/step - loss: 0.9113  
Epoch 6/100  
504/504 [=====] - 0s 124us/step - loss: 0.8517  
Epoch 7/100  
504/504 [=====] - 0s 93us/step - loss: 0.8023  
Epoch 8/100  
504/504 [=====] - 0s 124us/step - loss: 0.7581  
Epoch 9/100  
504/504 [=====] - 0s 93us/step - loss: 0.7208  
Epoch 10/100  
504/504 [=====] - 0s 93us/step - loss: 0.6864  
Epoch 11/100  
504/504 [=====] - 0s 124us/step - loss: 0.6547  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 0.6260  
Epoch 13/100  
504/504 [=====] - 0s 124us/step - loss: 0.6002  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.5767  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.5546  
Epoch 16/100  
504/504 [=====] - 0s 124us/step - loss: 0.5358

Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.5182  
Epoch 18/100  
504/504 [=====] - 0s 124us/step - loss: 0.5011  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.4866  
Epoch 20/100  
504/504 [=====] - 0s 124us/step - loss: 0.4724  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.4598  
Epoch 22/100  
504/504 [=====] - 0s 124us/step - loss: 0.4474  
Epoch 23/100  
504/504 [=====] - 0s 124us/step - loss: 0.4363  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.4260  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.4163  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.4071  
Epoch 27/100  
504/504 [=====] - 0s 124us/step - loss: 0.3984  
Epoch 28/100  
504/504 [=====] - 0s 124us/step - loss: 0.3915  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3834  
Epoch 30/100  
504/504 [=====] - 0s 124us/step - loss: 0.3765  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3699  
Epoch 32/100  
504/504 [=====] - 0s 124us/step - loss: 0.3636  
Epoch 33/100  
504/504 [=====] - 0s 124us/step - loss: 0.3576  
Epoch 34/100  
504/504 [=====] - 0s 155us/step - loss: 0.3519  
Epoch 35/100  
504/504 [=====] - 0s 155us/step - loss: 0.3470  
Epoch 36/100  
504/504 [=====] - 0s 155us/step - loss: 0.3414  
Epoch 37/100  
504/504 [=====] - 0s 124us/step - loss: 0.3359  
Epoch 38/100  
504/504 [=====] - 0s 124us/step - loss: 0.3317  
Epoch 39/100  
504/504 [=====] - 0s 124us/step - loss: 0.3266  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.3225

Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.3176  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.3140  
Epoch 43/100  
504/504 [=====] - 0s 124us/step - loss: 0.3099  
Epoch 44/100  
504/504 [=====] - 0s 124us/step - loss: 0.3061  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.3025  
Epoch 46/100  
504/504 [=====] - 0s 94us/step - loss: 0.2985  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.2948  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2921  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2890  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2860  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.2829  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.2796  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2773  
Epoch 54/100  
504/504 [=====] - 0s 124us/step - loss: 0.2743  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2717  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2692  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2667  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2640  
Epoch 59/100  
504/504 [=====] - 0s 124us/step - loss: 0.2622  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2597  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2572  
Epoch 62/100  
504/504 [=====] - 0s 124us/step - loss: 0.2551  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2528  
Epoch 64/100  
504/504 [=====] - 0s 124us/step - loss: 0.2505

Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2478  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2460  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.2434  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2418  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2394  
Epoch 70/100  
504/504 [=====] - 0s 124us/step - loss: 0.2379  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2357  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.2343  
Epoch 73/100  
504/504 [=====] - 0s 124us/step - loss: 0.2331  
Epoch 74/100  
504/504 [=====] - 0s 124us/step - loss: 0.2307  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.2289  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.2276  
Epoch 77/100  
504/504 [=====] - 0s 124us/step - loss: 0.2259  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.2245  
Epoch 79/100  
504/504 [=====] - 0s 155us/step - loss: 0.2237  
Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.2211  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.2198  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.2189  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.2174  
Epoch 84/100  
504/504 [=====] - 0s 124us/step - loss: 0.2161  
Epoch 85/100  
504/504 [=====] - 0s 124us/step - loss: 0.2156  
Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.2140  
Epoch 87/100  
504/504 [=====] - 0s 124us/step - loss: 0.2131  
Epoch 88/100  
504/504 [=====] - 0s 124us/step - loss: 0.2112



Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.2103  
Epoch 90/100  
504/504 [=====] - 0s 124us/step - loss: 0.2103  
Epoch 91/100  
504/504 [=====] - 0s 124us/step - loss: 0.2080  
Epoch 92/100  
504/504 [=====] - 0s 124us/step - loss: 0.2072  
Epoch 93/100  
504/504 [=====] - 0s 155us/step - loss: 0.2061  
Epoch 94/100  
504/504 [=====] - 0s 124us/step - loss: 0.2050  
Epoch 95/100  
504/504 [=====] - 0s 124us/step - loss: 0.2047  
Epoch 96/100  
504/504 [=====] - 0s 124us/step - loss: 0.2026  
Epoch 97/100  
504/504 [=====] - 0s 124us/step - loss: 0.2016  
Epoch 98/100  
504/504 [=====] - 0s 124us/step - loss: 0.2006  
Epoch 99/100  
504/504 [=====] - 0s 93us/step - loss: 0.1997  
Epoch 100/100  
504/504 [=====] - 0s 124us/step - loss: 0.1987  
Epoch 1/100  
504/504 [=====] - 4s 7ms/step - loss: 1.6877  
Epoch 2/100  
504/504 [=====] - 0s 93us/step - loss: 1.4889  
Epoch 3/100  
504/504 [=====] - 0s 93us/step - loss: 1.3224  
Epoch 4/100  
504/504 [=====] - 0s 93us/step - loss: 1.1882  
Epoch 5/100  
504/504 [=====] - 0s 124us/step - loss: 1.0791  
Epoch 6/100  
504/504 [=====] - 0s 93us/step - loss: 0.9882  
Epoch 7/100  
504/504 [=====] - 0s 93us/step - loss: 0.9081  
Epoch 8/100  
504/504 [=====] - 0s 93us/step - loss: 0.8434  
Epoch 9/100  
504/504 [=====] - 0s 93us/step - loss: 0.7834  
Epoch 10/100  
504/504 [=====] - 0s 124us/step - loss: 0.7351  
Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 0.6931  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 0.6561

Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.6226  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.5945  
Epoch 15/100  
504/504 [=====] - 0s 124us/step - loss: 0.5702  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.5494  
Epoch 17/100  
504/504 [=====] - 0s 124us/step - loss: 0.5312  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.5150  
Epoch 19/100  
504/504 [=====] - 0s 124us/step - loss: 0.5022  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.4897  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.4800  
Epoch 22/100  
504/504 [=====] - 0s 93us/step - loss: 0.4702  
Epoch 23/100  
504/504 [=====] - 0s 124us/step - loss: 0.4619  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.4539  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.4466  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.4401  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.4342  
Epoch 28/100  
504/504 [=====] - 0s 124us/step - loss: 0.4288  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.4241  
Epoch 30/100  
504/504 [=====] - 0s 124us/step - loss: 0.4188  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.4139  
Epoch 32/100  
504/504 [=====] - 0s 124us/step - loss: 0.4096  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.4053  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.4013  
Epoch 35/100  
504/504 [=====] - 0s 124us/step - loss: 0.3970  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.3938

Epoch 37/100  
504/504 [=====] - 0s 124us/step - loss: 0.3895  
Epoch 38/100  
504/504 [=====] - 0s 124us/step - loss: 0.3859  
Epoch 39/100  
504/504 [=====] - 0s 124us/step - loss: 0.3822  
Epoch 40/100  
504/504 [=====] - 0s 155us/step - loss: 0.3787  
Epoch 41/100  
504/504 [=====] - 0s 124us/step - loss: 0.3754  
Epoch 42/100  
504/504 [=====] - 0s 124us/step - loss: 0.3719  
Epoch 43/100  
504/504 [=====] - 0s 124us/step - loss: 0.3693  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.3659  
Epoch 45/100  
504/504 [=====] - 0s 124us/step - loss: 0.3626  
Epoch 46/100  
504/504 [=====] - 0s 124us/step - loss: 0.3599  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.3572  
Epoch 48/100  
504/504 [=====] - 0s 124us/step - loss: 0.3552  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.3517  
Epoch 50/100  
504/504 [=====] - 0s 124us/step - loss: 0.3484  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.3462  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.3429  
Epoch 53/100  
504/504 [=====] - 0s 155us/step - loss: 0.3407  
Epoch 54/100  
504/504 [=====] - 0s 124us/step - loss: 0.3376  
Epoch 55/100  
504/504 [=====] - 0s 124us/step - loss: 0.3349  
Epoch 56/100  
504/504 [=====] - 0s 155us/step - loss: 0.3333  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.3294  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.3268  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.3245  
Epoch 60/100  
504/504 [=====] - 0s 124us/step - loss: 0.3218

Epoch 61/100  
504/504 [=====] - 0s 155us/step - loss: 0.3190  
Epoch 62/100  
504/504 [=====] - 0s 155us/step - loss: 0.3165  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.3140  
Epoch 64/100  
504/504 [=====] - 0s 124us/step - loss: 0.3116  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.3088  
Epoch 66/100  
504/504 [=====] - 0s 124us/step - loss: 0.3063  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.3038  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.3008  
Epoch 69/100  
504/504 [=====] - 0s 124us/step - loss: 0.2982  
Epoch 70/100  
504/504 [=====] - 0s 124us/step - loss: 0.2958  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2932  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.2902  
Epoch 73/100  
504/504 [=====] - 0s 124us/step - loss: 0.2876  
Epoch 74/100  
504/504 [=====] - 0s 124us/step - loss: 0.2849  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.2829  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.2803  
Epoch 77/100  
504/504 [=====] - 0s 124us/step - loss: 0.2777  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.2753  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.2728  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.2701  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.2672  
Epoch 82/100  
504/504 [=====] - 0s 124us/step - loss: 0.2647  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.2620  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.2592

Epoch 85/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2565  
 Epoch 86/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2539  
 Epoch 87/100  
 504/504 [=====] - ETA: 0s - loss: 0.226 - 0s 93us/step  
 - loss: 0.2512  
 Epoch 88/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2481  
 Epoch 89/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2453  
 Epoch 90/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2425  
 Epoch 91/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2393  
 Epoch 92/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2368  
 Epoch 93/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2343  
 Epoch 94/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2318  
 Epoch 95/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2299  
 Epoch 96/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2269  
 Epoch 97/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2246  
 Epoch 98/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2224  
 Epoch 99/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2205  
 Epoch 100/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2190  
 Epoch 1/100  
 504/504 [=====] - 4s 8ms/step - loss: 1.4711  
 Epoch 2/100  
 504/504 [=====] - 0s 124us/step - loss: 1.3020  
 Epoch 3/100  
 504/504 [=====] - 0s 93us/step - loss: 1.1649  
 Epoch 4/100  
 504/504 [=====] - 0s 124us/step - loss: 1.0552  
 Epoch 5/100  
 504/504 [=====] - 0s 93us/step - loss: 0.9645  
 Epoch 6/100  
 504/504 [=====] - 0s 93us/step - loss: 0.8927  
 Epoch 7/100  
 504/504 [=====] - 0s 124us/step - loss: 0.8319  
 Epoch 8/100

504/504 [=====] - 0s 93us/step - loss: 0.7824  
Epoch 9/100  
504/504 [=====] - 0s 93us/step - loss: 0.7369  
Epoch 10/100  
504/504 [=====] - 0s 124us/step - loss: 0.6981  
Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 0.6641  
Epoch 12/100  
504/504 [=====] - 0s 124us/step - loss: 0.6355  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.6079  
Epoch 14/100  
504/504 [=====] - 0s 124us/step - loss: 0.5841  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.5621  
Epoch 16/100  
504/504 [=====] - 0s 124us/step - loss: 0.5436  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.5267  
Epoch 18/100  
504/504 [=====] - 0s 124us/step - loss: 0.5113  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.4970  
Epoch 20/100  
504/504 [=====] - 0s 124us/step - loss: 0.4840  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.4725  
Epoch 22/100  
504/504 [=====] - 0s 124us/step - loss: 0.4626  
Epoch 23/100  
504/504 [=====] - 0s 124us/step - loss: 0.4531  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.4440  
Epoch 25/100  
504/504 [=====] - 0s 124us/step - loss: 0.4359  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.4278  
Epoch 27/100  
504/504 [=====] - 0s 124us/step - loss: 0.4205  
Epoch 28/100  
504/504 [=====] - 0s 124us/step - loss: 0.4139  
Epoch 29/100  
504/504 [=====] - 0s 124us/step - loss: 0.4078  
Epoch 30/100  
504/504 [=====] - 0s 124us/step - loss: 0.4015  
Epoch 31/100  
504/504 [=====] - 0s 124us/step - loss: 0.3956  
Epoch 32/100

```

504/504 [=====] - 0s 124us/step - loss: 0.3903
Epoch 33/100
504/504 [=====] - 0s 124us/step - loss: 0.3844
Epoch 34/100
504/504 [=====] - 0s 124us/step - loss: 0.3799
Epoch 35/100
504/504 [=====] - 0s 124us/step - loss: 0.3746
Epoch 36/100
504/504 [=====] - 0s 124us/step - loss: 0.3699
Epoch 37/100
504/504 [=====] - 0s 124us/step - loss: 0.3645
Epoch 38/100
504/504 [=====] - 0s 155us/step - loss: 0.3602
Epoch 39/100
504/504 [=====] - 0s 93us/step - loss: 0.3552
Epoch 40/100
504/504 [=====] - 0s 124us/step - loss: 0.3512
Epoch 41/100
504/504 [=====] - 0s 124us/step - loss: 0.3468
Epoch 42/100
504/504 [=====] - 0s 93us/step - loss: 0.3417
Epoch 43/100
504/504 [=====] - 0s 124us/step - loss: 0.3368
Epoch 44/100
504/504 [=====] - 0s 124us/step - loss: 0.3321
Epoch 45/100
504/504 [=====] - 0s 125us/step - loss: 0.3277
Epoch 46/100
504/504 [=====] - 0s 93us/step - loss: 0.3231
Epoch 47/100
504/504 [=====] - 0s 124us/step - loss: 0.3188
Epoch 48/100
504/504 [=====] - 0s 93us/step - loss: 0.3150
Epoch 49/100
504/504 [=====] - 0s 124us/step - loss: 0.3108
Epoch 50/100
504/504 [=====] - ETA: 0s - loss: 0.150 - 0s 93us/step
- loss: 0.3069
Epoch 51/100
504/504 [=====] - 0s 93us/step - loss: 0.3031
Epoch 52/100
504/504 [=====] - 0s 93us/step - loss: 0.2994
Epoch 53/100
504/504 [=====] - 0s 124us/step - loss: 0.2957
Epoch 54/100
504/504 [=====] - 0s 124us/step - loss: 0.2929
Epoch 55/100
504/504 [=====] - 0s 155us/step - loss: 0.2893

```

Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2861  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2830  
Epoch 58/100  
504/504 [=====] - 0s 155us/step - loss: 0.2796  
Epoch 59/100  
504/504 [=====] - 0s 124us/step - loss: 0.2769  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2738  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2712  
Epoch 62/100  
504/504 [=====] - 0s 155us/step - loss: 0.2684  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2665  
Epoch 64/100  
504/504 [=====] - 0s 124us/step - loss: 0.2645  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2616  
Epoch 66/100  
504/504 [=====] - 0s 155us/step - loss: 0.2584  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2567  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2544  
Epoch 69/100  
504/504 [=====] - 0s 124us/step - loss: 0.2522  
Epoch 70/100  
504/504 [=====] - 0s 124us/step - loss: 0.2497  
Epoch 71/100  
504/504 [=====] - 0s 124us/step - loss: 0.2478  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.2457  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2435  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.2410  
Epoch 75/100  
504/504 [=====] - 0s 124us/step - loss: 0.2392  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.2370  
Epoch 77/100  
504/504 [=====] - 0s 124us/step - loss: 0.2349  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.2329  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.2311



Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.2289  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.2270  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.2252  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.2236  
Epoch 84/100  
504/504 [=====] - 0s 155us/step - loss: 0.2217  
Epoch 85/100  
504/504 [=====] - 0s 124us/step - loss: 0.2206  
Epoch 86/100  
504/504 [=====] - 0s 124us/step - loss: 0.2196  
Epoch 87/100  
504/504 [=====] - 0s 155us/step - loss: 0.2180  
Epoch 88/100  
504/504 [=====] - 0s 124us/step - loss: 0.2160  
Epoch 89/100  
504/504 [=====] - 0s 124us/step - loss: 0.2146  
Epoch 90/100  
504/504 [=====] - 0s 155us/step - loss: 0.2135  
Epoch 91/100  
504/504 [=====] - 0s 124us/step - loss: 0.2114  
Epoch 92/100  
504/504 [=====] - 0s 124us/step - loss: 0.2107  
Epoch 93/100  
504/504 [=====] - 0s 124us/step - loss: 0.2097  
Epoch 94/100  
504/504 [=====] - 0s 124us/step - loss: 0.2075  
Epoch 95/100  
504/504 [=====] - 0s 93us/step - loss: 0.2069  
Epoch 96/100  
504/504 [=====] - 0s 93us/step - loss: 0.2054  
Epoch 97/100  
504/504 [=====] - 0s 93us/step - loss: 0.2042  
Epoch 98/100  
504/504 [=====] - 0s 124us/step - loss: 0.2035  
Epoch 99/100  
504/504 [=====] - 0s 93us/step - loss: 0.2019  
Epoch 100/100  
504/504 [=====] - 0s 124us/step - loss: 0.2018  
Epoch 1/100  
504/504 [=====] - 4s 8ms/step - loss: 1.5186  
Epoch 2/100  
504/504 [=====] - 0s 93us/step - loss: 1.3045  
Epoch 3/100  
504/504 [=====] - 0s 124us/step - loss: 1.1325

Epoch 4/100  
504/504 [=====] - 0s 93us/step - loss: 0.9997  
Epoch 5/100  
504/504 [=====] - 0s 124us/step - loss: 0.9003  
Epoch 6/100  
504/504 [=====] - 0s 93us/step - loss: 0.8181  
Epoch 7/100  
504/504 [=====] - 0s 124us/step - loss: 0.7573  
Epoch 8/100  
504/504 [=====] - 0s 124us/step - loss: 0.7066  
Epoch 9/100  
504/504 [=====] - 0s 124us/step - loss: 0.6681  
Epoch 10/100  
504/504 [=====] - 0s 124us/step - loss: 0.6349  
Epoch 11/100  
504/504 [=====] - 0s 124us/step - loss: 0.6104  
Epoch 12/100  
504/504 [=====] - 0s 124us/step - loss: 0.5867  
Epoch 13/100  
504/504 [=====] - 0s 124us/step - loss: 0.5684  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.5530  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.5361  
Epoch 16/100  
504/504 [=====] - 0s 124us/step - loss: 0.5231  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.5107  
Epoch 18/100  
504/504 [=====] - 0s 124us/step - loss: 0.4992  
Epoch 19/100  
504/504 [=====] - 0s 124us/step - loss: 0.4881  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.4768  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.4672  
Epoch 22/100  
504/504 [=====] - ETA: 0s - loss: 0.464 - 0s 124us/step  
- loss: 0.4582  
Epoch 23/100  
504/504 [=====] - 0s 124us/step - loss: 0.4492  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.4420  
Epoch 25/100  
504/504 [=====] - 0s 124us/step - loss: 0.4342  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.4271  
Epoch 27/100

504/504 [=====] - 0s 93us/step - loss: 0.4190  
 Epoch 28/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4121  
 Epoch 29/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4053  
 Epoch 30/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3981  
 Epoch 31/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3913  
 Epoch 32/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3850  
 Epoch 33/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3793  
 Epoch 34/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3746  
 Epoch 35/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3695  
 Epoch 36/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3632  
 Epoch 37/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3580  
 Epoch 38/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3540  
 Epoch 39/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3493  
 Epoch 40/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3448  
 Epoch 41/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3404  
 Epoch 42/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3356  
 Epoch 43/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3318  
 Epoch 44/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3278  
 Epoch 45/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3235  
 Epoch 46/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3195  
 Epoch 47/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3162  
 Epoch 48/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3128  
 Epoch 49/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3100  
 Epoch 50/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3057  
 Epoch 51/100

504/504 [=====] - 0s 124us/step - loss: 0.3025  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.3003  
Epoch 53/100  
504/504 [=====] - 0s 124us/step - loss: 0.2972  
Epoch 54/100  
504/504 [=====] - 0s 155us/step - loss: 0.2940  
Epoch 55/100  
504/504 [=====] - 0s 124us/step - loss: 0.2908  
Epoch 56/100  
504/504 [=====] - 0s 155us/step - loss: 0.2881  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2847  
Epoch 58/100  
504/504 [=====] - 0s 124us/step - loss: 0.2824  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2800  
Epoch 60/100  
504/504 [=====] - 0s 124us/step - loss: 0.2780  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.2752  
Epoch 62/100  
504/504 [=====] - 0s 124us/step - loss: 0.2733  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2709  
Epoch 64/100  
504/504 [=====] - 0s 124us/step - loss: 0.2680  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2666  
Epoch 66/100  
504/504 [=====] - 0s 124us/step - loss: 0.2639  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.2620  
Epoch 68/100  
504/504 [=====] - 0s 124us/step - loss: 0.2601  
Epoch 69/100  
504/504 [=====] - 0s 124us/step - loss: 0.2578  
Epoch 70/100  
504/504 [=====] - 0s 124us/step - loss: 0.2559  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2549  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.2525  
Epoch 73/100  
504/504 [=====] - 0s 124us/step - loss: 0.2513  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.2489  
Epoch 75/100

504/504 [=====] - 0s 124us/step - loss: 0.2475  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.2456  
Epoch 77/100  
504/504 [=====] - 0s 124us/step - loss: 0.2443  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.2426  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.2407  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.2388  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.2382  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.2366  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.2354  
Epoch 84/100  
504/504 [=====] - 0s 124us/step - loss: 0.2335  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.2318  
Epoch 86/100  
504/504 [=====] - 0s 124us/step - loss: 0.2311  
Epoch 87/100  
504/504 [=====] - 0s 93us/step - loss: 0.2298  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.2286  
Epoch 89/100  
504/504 [=====] - 0s 124us/step - loss: 0.2275  
Epoch 90/100  
504/504 [=====] - 0s 124us/step - loss: 0.2262  
Epoch 91/100  
504/504 [=====] - 0s 93us/step - loss: 0.2252  
Epoch 92/100  
504/504 [=====] - 0s 93us/step - loss: 0.2239  
Epoch 93/100  
504/504 [=====] - 0s 124us/step - loss: 0.2232  
Epoch 94/100  
504/504 [=====] - 0s 93us/step - loss: 0.2220  
Epoch 95/100  
504/504 [=====] - 0s 124us/step - loss: 0.2216  
Epoch 96/100  
504/504 [=====] - 0s 124us/step - loss: 0.2202  
Epoch 97/100  
504/504 [=====] - 0s 93us/step - loss: 0.2195  
Epoch 98/100  
504/504 [=====] - 0s 124us/step - loss: 0.2191  
Epoch 99/100

```

504/504 [=====] - 0s 93us/step - loss: 0.2177
Epoch 100/100
504/504 [=====] - 0s 124us/step - loss: 0.2172
Epoch 1/100
504/504 [=====] - 3s 7ms/step - loss: 1.6810
Epoch 2/100
504/504 [=====] - 0s 93us/step - loss: 1.4599
Epoch 3/100
504/504 [=====] - 0s 93us/step - loss: 1.2709
Epoch 4/100
504/504 [=====] - 0s 124us/step - loss: 1.1231
Epoch 5/100
504/504 [=====] - 0s 93us/step - loss: 0.9968
Epoch 6/100
504/504 [=====] - 0s 93us/step - loss: 0.8907
Epoch 7/100
504/504 [=====] - 0s 93us/step - loss: 0.8027
Epoch 8/100
504/504 [=====] - 0s 93us/step - loss: 0.7304
Epoch 9/100
504/504 [=====] - 0s 93us/step - loss: 0.6748
Epoch 10/100
504/504 [=====] - 0s 93us/step - loss: 0.6268
Epoch 11/100
504/504 [=====] - 0s 93us/step - loss: 0.5887
Epoch 12/100
504/504 [=====] - 0s 124us/step - loss: 0.5553
Epoch 13/100
504/504 [=====] - 0s 93us/step - loss: 0.5298
Epoch 14/100
504/504 [=====] - 0s 93us/step - loss: 0.5058
Epoch 15/100
504/504 [=====] - 0s 124us/step - loss: 0.4871
Epoch 16/100
504/504 [=====] - 0s 93us/step - loss: 0.4697
Epoch 17/100
504/504 [=====] - 0s 124us/step - loss: 0.4540
Epoch 18/100
504/504 [=====] - 0s 124us/step - loss: 0.4402
Epoch 19/100
504/504 [=====] - ETA: 0s - loss: 0.569 - 0s 93us/step
- loss: 0.4271
Epoch 20/100
504/504 [=====] - 0s 93us/step - loss: 0.4143
Epoch 21/100
504/504 [=====] - 0s 93us/step - loss: 0.4040
Epoch 22/100
504/504 [=====] - 0s 93us/step - loss: 0.3929

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Epoch 23/100  
504/504 [=====] - 0s 124us/step - loss: 0.3828  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.3734  
Epoch 25/100  
504/504 [=====] - 0s 124us/step - loss: 0.3648  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.3567  
Epoch 27/100  
504/504 [=====] - 0s 124us/step - loss: 0.3486  
Epoch 28/100  
504/504 [=====] - 0s 124us/step - loss: 0.3415  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3345  
Epoch 30/100  
504/504 [=====] - 0s 124us/step - loss: 0.3283  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3208  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.3151  
Epoch 33/100  
504/504 [=====] - 0s 124us/step - loss: 0.3097  
Epoch 34/100  
504/504 [=====] - 0s 124us/step - loss: 0.3040  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.2973  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.2919  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.2867  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.2821  
Epoch 39/100  
504/504 [=====] - 0s 124us/step - loss: 0.2771  
Epoch 40/100  
504/504 [=====] - 0s 124us/step - loss: 0.2726  
Epoch 41/100  
504/504 [=====] - 0s 124us/step - loss: 0.2681  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.2639  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.2598  
Epoch 44/100  
504/504 [=====] - 0s 124us/step - loss: 0.2560  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.2520  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.2484

Epoch 47/100  
504/504 [=====] - 0s 124us/step - loss: 0.2449  
Epoch 48/100  
504/504 [=====] - 0s 124us/step - loss: 0.2415  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2380  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2347  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2319  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.2285  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2260  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2231  
Epoch 55/100  
504/504 [=====] - 0s 124us/step - loss: 0.2207  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2180  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2164  
Epoch 58/100  
504/504 [=====] - 0s 124us/step - loss: 0.2148  
Epoch 59/100  
504/504 [=====] - 0s 124us/step - loss: 0.2121  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2105  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.2085  
Epoch 62/100  
504/504 [=====] - 0s 124us/step - loss: 0.2069  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2051  
Epoch 64/100  
504/504 [=====] - 0s 124us/step - loss: 0.2032  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2017  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2006  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.1989  
Epoch 68/100  
504/504 [=====] - 0s 124us/step - loss: 0.1977  
Epoch 69/100  
504/504 [=====] - 0s 124us/step - loss: 0.1963  
Epoch 70/100  
504/504 [=====] - 0s 124us/step - loss: 0.1953



Epoch 71/100  
504/504 [=====] - 0s 124us/step - loss: 0.1938  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.1925  
Epoch 73/100  
504/504 [=====] - 0s 124us/step - loss: 0.1917  
Epoch 74/100  
504/504 [=====] - 0s 125us/step - loss: 0.1901  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.1895  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.1882  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.1872  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.1859  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.1853  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.1840  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.1832  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.1820  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.1815  
Epoch 84/100  
504/504 [=====] - 0s 124us/step - loss: 0.1804  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.1797  
Epoch 86/100  
504/504 [=====] - 0s 124us/step - loss: 0.1786  
Epoch 87/100  
504/504 [=====] - 0s 124us/step - loss: 0.1780  
Epoch 88/100  
504/504 [=====] - 0s 124us/step - loss: 0.1765  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.1761  
Epoch 90/100  
504/504 [=====] - 0s 124us/step - loss: 0.1748  
Epoch 91/100  
504/504 [=====] - 0s 93us/step - loss: 0.1745  
Epoch 92/100  
504/504 [=====] - 0s 93us/step - loss: 0.1731  
Epoch 93/100  
504/504 [=====] - 0s 93us/step - loss: 0.1731  
Epoch 94/100  
504/504 [=====] - 0s 93us/step - loss: 0.1712

Epoch 95/100  
504/504 [=====] - 0s 124us/step - loss: 0.1712  
Epoch 96/100  
504/504 [=====] - 0s 124us/step - loss: 0.1698  
Epoch 97/100  
504/504 [=====] - 0s 93us/step - loss: 0.1695  
Epoch 98/100  
504/504 [=====] - 0s 124us/step - loss: 0.1687  
Epoch 99/100  
504/504 [=====] - 0s 93us/step - loss: 0.1677  
Epoch 100/100  
504/504 [=====] - 0s 93us/step - loss: 0.1673  
Epoch 1/100  
504/504 [=====] - 4s 7ms/step - loss: 1.9456  
Epoch 2/100  
504/504 [=====] - 0s 124us/step - loss: 1.5700  
Epoch 3/100  
504/504 [=====] - 0s 93us/step - loss: 1.2719  
Epoch 4/100  
504/504 [=====] - 0s 124us/step - loss: 1.0541  
Epoch 5/100  
504/504 [=====] - 0s 93us/step - loss: 0.8919  
Epoch 6/100  
504/504 [=====] - 0s 93us/step - loss: 0.7725  
Epoch 7/100  
504/504 [=====] - 0s 93us/step - loss: 0.6838  
Epoch 8/100  
504/504 [=====] - 0s 124us/step - loss: 0.6189  
Epoch 9/100  
504/504 [=====] - 0s 93us/step - loss: 0.5692  
Epoch 10/100  
504/504 [=====] - 0s 124us/step - loss: 0.5284  
Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 0.4972  
Epoch 12/100  
504/504 [=====] - 0s 124us/step - loss: 0.4701  
Epoch 13/100  
504/504 [=====] - 0s 124us/step - loss: 0.4470  
Epoch 14/100  
504/504 [=====] - 0s 124us/step - loss: 0.4276  
Epoch 15/100  
504/504 [=====] - 0s 124us/step - loss: 0.4110  
Epoch 16/100  
504/504 [=====] - 0s 124us/step - loss: 0.3964  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.3841  
Epoch 18/100  
504/504 [=====] - 0s 124us/step - loss: 0.3729

Epoch 19/100  
504/504 [=====] - 0s 124us/step - loss: 0.3634  
Epoch 20/100  
504/504 [=====] - 0s 124us/step - loss: 0.3548  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.3466  
Epoch 22/100  
504/504 [=====] - 0s 93us/step - loss: 0.3399  
Epoch 23/100  
504/504 [=====] - 0s 124us/step - loss: 0.3331  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.3270  
Epoch 25/100  
504/504 [=====] - 0s 124us/step - loss: 0.3205  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.3153  
Epoch 27/100  
504/504 [=====] - 0s 124us/step - loss: 0.3095  
Epoch 28/100  
504/504 [=====] - 0s 124us/step - loss: 0.3046  
Epoch 29/100  
504/504 [=====] - 0s 124us/step - loss: 0.2998  
Epoch 30/100  
504/504 [=====] - 0s 124us/step - loss: 0.2953  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.2911  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.2864  
Epoch 33/100  
504/504 [=====] - 0s 124us/step - loss: 0.2824  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.2786  
Epoch 35/100  
504/504 [=====] - 0s 124us/step - loss: 0.2751  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.2716  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.2684  
Epoch 38/100  
504/504 [=====] - 0s 124us/step - loss: 0.2651  
Epoch 39/100  
504/504 [=====] - 0s 124us/step - loss: 0.2618  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.2586  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.2558  
Epoch 42/100  
504/504 [=====] - 0s 124us/step - loss: 0.2527

Epoch 43/100  
504/504 [=====] - 0s 124us/step - loss: 0.2499  
Epoch 44/100  
504/504 [=====] - 0s 124us/step - loss: 0.2471  
Epoch 45/100  
504/504 [=====] - 0s 124us/step - loss: 0.2448  
Epoch 46/100  
504/504 [=====] - 0s 124us/step - loss: 0.2424  
Epoch 47/100  
504/504 [=====] - 0s 124us/step - loss: 0.2404  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2385  
Epoch 49/100  
504/504 [=====] - 0s 124us/step - loss: 0.2356  
Epoch 50/100  
504/504 [=====] - 0s 124us/step - loss: 0.2332  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.2315  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.2292  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2272  
Epoch 54/100  
504/504 [=====] - 0s 124us/step - loss: 0.2252  
Epoch 55/100  
504/504 [=====] - 0s 124us/step - loss: 0.2236  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2216  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2203  
Epoch 58/100  
504/504 [=====] - 0s 124us/step - loss: 0.2178  
Epoch 59/100  
504/504 [=====] - 0s 124us/step - loss: 0.2163  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2143  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.2126  
Epoch 62/100  
504/504 [=====] - 0s 124us/step - loss: 0.2116  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2093  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2083  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2064  
Epoch 66/100  
504/504 [=====] - 0s 124us/step - loss: 0.2045

Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2030  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2010  
Epoch 69/100  
504/504 [=====] - 0s 124us/step - loss: 0.1999  
Epoch 70/100  
504/504 [=====] - 0s 124us/step - loss: 0.1985  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.1970  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.1959  
Epoch 73/100  
504/504 [=====] - 0s 124us/step - loss: 0.1946  
Epoch 74/100  
504/504 [=====] - 0s 124us/step - loss: 0.1936  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.1919  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.1905  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.1891  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.1882  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.1870  
Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.1860  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.1844  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.1834  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.1823  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.1815  
Epoch 85/100  
504/504 [=====] - 0s 124us/step - loss: 0.1798  
Epoch 86/100  
504/504 [=====] - 0s 124us/step - loss: 0.1789  
Epoch 87/100  
504/504 [=====] - 0s 93us/step - loss: 0.1777  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.1770  
Epoch 89/100  
504/504 [=====] - 0s 124us/step - loss: 0.1757  
Epoch 90/100  
504/504 [=====] - 0s 93us/step - loss: 0.1747

Epoch 91/100  
504/504 [=====] - 0s 93us/step - loss: 0.1738  
Epoch 92/100  
504/504 [=====] - 0s 124us/step - loss: 0.1733  
Epoch 93/100  
504/504 [=====] - 0s 124us/step - loss: 0.1727  
Epoch 94/100  
504/504 [=====] - 0s 93us/step - loss: 0.1712  
Epoch 95/100  
504/504 [=====] - 0s 124us/step - loss: 0.1704  
Epoch 96/100  
504/504 [=====] - 0s 124us/step - loss: 0.1704  
Epoch 97/100  
504/504 [=====] - 0s 93us/step - loss: 0.1698  
Epoch 98/100  
504/504 [=====] - 0s 124us/step - loss: 0.1687  
Epoch 99/100  
504/504 [=====] - 0s 93us/step - loss: 0.1685  
Epoch 100/100  
504/504 [=====] - 0s 93us/step - loss: 0.1670  
Epoch 1/100  
504/504 [=====] - 4s 7ms/step - loss: 0.8471  
Epoch 2/100  
504/504 [=====] - 0s 124us/step - loss: 0.7556  
Epoch 3/100  
504/504 [=====] - 0s 93us/step - loss: 0.6856  
Epoch 4/100  
504/504 [=====] - 0s 93us/step - loss: 0.6288  
Epoch 5/100  
504/504 [=====] - 0s 93us/step - loss: 0.5840  
Epoch 6/100  
504/504 [=====] - 0s 93us/step - loss: 0.5465  
Epoch 7/100  
504/504 [=====] - 0s 124us/step - loss: 0.5172  
Epoch 8/100  
504/504 [=====] - 0s 93us/step - loss: 0.4929  
Epoch 9/100  
504/504 [=====] - 0s 124us/step - loss: 0.4715  
Epoch 10/100  
504/504 [=====] - 0s 93us/step - loss: 0.4533  
Epoch 11/100  
504/504 [=====] - 0s 124us/step - loss: 0.4393  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 0.4264  
Epoch 13/100  
504/504 [=====] - 0s 124us/step - loss: 0.4149  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.4050

Epoch 15/100  
504/504 [=====] - 0s 124us/step - loss: 0.3951  
Epoch 16/100  
504/504 [=====] - 0s 124us/step - loss: 0.3865  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.3786  
Epoch 18/100  
504/504 [=====] - 0s 124us/step - loss: 0.3707  
Epoch 19/100  
504/504 [=====] - 0s 94us/step - loss: 0.3644  
Epoch 20/100  
504/504 [=====] - 0s 124us/step - loss: 0.3568  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.3509  
Epoch 22/100  
504/504 [=====] - 0s 124us/step - loss: 0.3457  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.3388  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.3329  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.3275  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.3221  
Epoch 27/100  
504/504 [=====] - 0s 124us/step - loss: 0.3176  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.3118  
Epoch 29/100  
504/504 [=====] - 0s 124us/step - loss: 0.3073  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3029  
Epoch 31/100  
504/504 [=====] - 0s 124us/step - loss: 0.2988  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.2943  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.2897  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.2852  
Epoch 35/100  
504/504 [=====] - 0s 124us/step - loss: 0.2811  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.2768  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.2730  
Epoch 38/100  
504/504 [=====] - 0s 124us/step - loss: 0.2689

Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.2653  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.2612  
Epoch 41/100  
504/504 [=====] - 0s 124us/step - loss: 0.2566  
Epoch 42/100  
504/504 [=====] - 0s 124us/step - loss: 0.2536  
Epoch 43/100  
504/504 [=====] - 0s 124us/step - loss: 0.2490  
Epoch 44/100  
504/504 [=====] - 0s 124us/step - loss: 0.2453  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.2417  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.2379  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.2344  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2312  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2284  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2259  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.2226  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.2200  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2171  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2145  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2121  
Epoch 56/100  
504/504 [=====] - 0s 94us/step - loss: 0.2098  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2074  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2050  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2027  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2000  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.1971  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.1948



Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.1926  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.1897  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.1875  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.1856  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.1837  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.1813  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.1794  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.1775  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.1763  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.1744  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.1723  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.1712  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.1696  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.1684  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.1668  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.1654  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.1641  
Epoch 80/100  
504/504 [=====] - 0s 62us/step - loss: 0.1628  
Epoch 81/100  
504/504 [=====] - 0s 62us/step - loss: 0.1615  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.1604  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.1592  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.1578  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.1569  
Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.1566

Epoch 87/100  
504/504 [=====] - 0s 93us/step - loss: 0.1556  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.1537  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.1526  
Epoch 90/100  
504/504 [=====] - 0s 93us/step - loss: 0.1512  
Epoch 91/100  
504/504 [=====] - 0s 93us/step - loss: 0.1509  
Epoch 92/100  
504/504 [=====] - 0s 93us/step - loss: 0.1498  
Epoch 93/100  
504/504 [=====] - 0s 93us/step - loss: 0.1485  
Epoch 94/100  
504/504 [=====] - 0s 93us/step - loss: 0.1478  
Epoch 95/100  
504/504 [=====] - 0s 93us/step - loss: 0.1469  
Epoch 96/100  
504/504 [=====] - 0s 93us/step - loss: 0.1462  
Epoch 97/100  
504/504 [=====] - 0s 93us/step - loss: 0.1455  
Epoch 98/100  
504/504 [=====] - 0s 93us/step - loss: 0.1443  
Epoch 99/100  
504/504 [=====] - 0s 93us/step - loss: 0.1436  
Epoch 100/100  
504/504 [=====] - 0s 93us/step - loss: 0.1437  
Epoch 1/100  
504/504 [=====] - 3s 6ms/step - loss: 1.4180  
Epoch 2/100  
504/504 [=====] - 0s 78us/step - loss: 1.2454  
Epoch 3/100  
504/504 [=====] - 0s 93us/step - loss: 1.1092  
Epoch 4/100  
504/504 [=====] - 0s 93us/step - loss: 1.0023  
Epoch 5/100  
504/504 [=====] - 0s 93us/step - loss: 0.9163  
Epoch 6/100  
504/504 [=====] - 0s 93us/step - loss: 0.8448  
Epoch 7/100  
504/504 [=====] - 0s 93us/step - loss: 0.7873  
Epoch 8/100  
504/504 [=====] - 0s 93us/step - loss: 0.7406  
Epoch 9/100  
504/504 [=====] - 0s 93us/step - loss: 0.7011  
Epoch 10/100  
504/504 [=====] - 0s 93us/step - loss: 0.6660

Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 0.6384  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 0.6135  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.5923  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.5731  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.5574  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.5406  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.5267  
Epoch 18/100  
504/504 [=====] - 0s 124us/step - loss: 0.5138  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.5017  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.4896  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.4787  
Epoch 22/100  
504/504 [=====] - 0s 93us/step - loss: 0.4680  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.4582  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.4487  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.4389  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.4297  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.4208  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.4116  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.4018  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3921  
Epoch 31/100  
504/504 [=====] - 0s 124us/step - loss: 0.3833  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.3741  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3650  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.3565

Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.3481  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.3397  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3328  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3244  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3177  
Epoch 40/100  
504/504 [=====] - 0s 62us/step - loss: 0.3106  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.3036  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.2980  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.2917  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.2857  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.2798  
Epoch 46/100  
504/504 [=====] - 0s 124us/step - loss: 0.2752  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.2696  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2642  
Epoch 49/100  
504/504 [=====] - 0s 62us/step - loss: 0.2597  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2551  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2507  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.2461  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2420  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2389  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2348  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2317  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2278  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2255

Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2221  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2201  
Epoch 61/100  
504/504 [=====] - 0s 62us/step - loss: 0.2165  
Epoch 62/100  
504/504 [=====] - 0s 124us/step - loss: 0.2149  
Epoch 63/100  
504/504 [=====] - 0s 62us/step - loss: 0.2120  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2098  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2081  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2053  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.2037  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2017  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2003  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.1979  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.1964  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.1953  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.1933  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.1923  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.1906  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.1894  
Epoch 77/100  
504/504 [=====] - 0s 124us/step - loss: 0.1881  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.1866  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.1855  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.1842  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.1828  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.1817

```

Epoch 83/100
504/504 [=====] - 0s 93us/step - loss: 0.1806
Epoch 84/100
504/504 [=====] - 0s 93us/step - loss: 0.1794
Epoch 85/100
504/504 [=====] - 0s 93us/step - loss: 0.1783
Epoch 86/100
504/504 [=====] - 0s 93us/step - loss: 0.1771
Epoch 87/100
504/504 [=====] - 0s 93us/step - loss: 0.1764
Epoch 88/100
504/504 [=====] - 0s 93us/step - loss: 0.1749
Epoch 89/100
504/504 [=====] - 0s 93us/step - loss: 0.1741
Epoch 90/100
504/504 [=====] - 0s 93us/step - loss: 0.1730
Epoch 91/100
504/504 [=====] - 0s 93us/step - loss: 0.1724
Epoch 92/100
504/504 [=====] - 0s 93us/step - loss: 0.1707
Epoch 93/100
504/504 [=====] - 0s 93us/step - loss: 0.1698
Epoch 94/100
504/504 [=====] - 0s 93us/step - loss: 0.1688
Epoch 95/100
504/504 [=====] - 0s 93us/step - loss: 0.1677
Epoch 96/100
504/504 [=====] - 0s 93us/step - loss: 0.1674
Epoch 97/100
504/504 [=====] - 0s 93us/step - loss: 0.1654
Epoch 98/100
504/504 [=====] - 0s 93us/step - loss: 0.1649
Epoch 99/100
504/504 [=====] - 0s 93us/step - loss: 0.1638
Epoch 100/100
504/504 [=====] - 0s 93us/step - loss: 0.1624
Epoch 1/100
504/504 [=====] - 3s 6ms/step - loss: 1.8169
Epoch 2/100
504/504 [=====] - 0s 93us/step - loss: 1.5400
Epoch 3/100
504/504 [=====] - 0s 93us/step - loss: 1.3282
Epoch 4/100
504/504 [=====] - 0s 93us/step - loss: 1.1690
Epoch 5/100
504/504 [=====] - 0s 93us/step - loss: 1.0439
Epoch 6/100
504/504 [=====] - 0s 93us/step - loss: 0.9455

```

Epoch 7/100  
504/504 [=====] - 0s 93us/step - loss: 0.8672  
Epoch 8/100  
504/504 [=====] - 0s 93us/step - loss: 0.8025  
Epoch 9/100  
504/504 [=====] - 0s 124us/step - loss: 0.7490  
Epoch 10/100  
504/504 [=====] - 0s 93us/step - loss: 0.7008  
Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 0.6586  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 0.6260  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.5961  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.5699  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.5469  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.5272  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.5086  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.4936  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.4789  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.4662  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.4541  
Epoch 22/100  
504/504 [=====] - 0s 93us/step - loss: 0.4436  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.4342  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.4249  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.4158  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.4081  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.4002  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.3932  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3872  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3795

Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3738  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.3683  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3639  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.3589  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.3546  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.3503  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3464  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3424  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3390  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.3357  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.3324  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.3292  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.3263  
Epoch 44/100  
504/504 [=====] - 0s 124us/step - loss: 0.3238  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.3206  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.3181  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.3148  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.3123  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.3098  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.3075  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.3051  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.3030  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.3007  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2988



Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2971  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2954  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2934  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2916  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2893  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2881  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2866  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2841  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2825  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2812  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2787  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2765  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2736  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2708  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2684  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2662  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2633  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.2610  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2585  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.2562  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.2534  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.2506  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.2482  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.2455

Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.2423  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.2401  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.2370  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.2343  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.2322  
Epoch 84/100  
504/504 [=====] - 0s 62us/step - loss: 0.2300  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.2282  
Epoch 86/100  
504/504 [=====] - 0s 62us/step - loss: 0.2272  
Epoch 87/100  
504/504 [=====] - 0s 93us/step - loss: 0.2264  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.2230  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.2215  
Epoch 90/100  
504/504 [=====] - 0s 93us/step - loss: 0.2198  
Epoch 91/100  
504/504 [=====] - 0s 93us/step - loss: 0.2178  
Epoch 92/100  
504/504 [=====] - 0s 93us/step - loss: 0.2164  
Epoch 93/100  
504/504 [=====] - 0s 93us/step - loss: 0.2147  
Epoch 94/100  
504/504 [=====] - 0s 93us/step - loss: 0.2135  
Epoch 95/100  
504/504 [=====] - 0s 93us/step - loss: 0.2120  
Epoch 96/100  
504/504 [=====] - 0s 93us/step - loss: 0.2102  
Epoch 97/100  
504/504 [=====] - 0s 93us/step - loss: 0.2088  
Epoch 98/100  
504/504 [=====] - 0s 93us/step - loss: 0.2073  
Epoch 99/100  
504/504 [=====] - 0s 93us/step - loss: 0.2060  
Epoch 100/100  
504/504 [=====] - 0s 62us/step - loss: 0.2045  
Epoch 1/100  
504/504 [=====] - 3s 7ms/step - loss: 1.5229  
Epoch 2/100  
504/504 [=====] - 0s 93us/step - loss: 1.3580

Epoch 3/100  
504/504 [=====] - 0s 97us/step - loss: 1.2169  
Epoch 4/100  
504/504 [=====] - 0s 93us/step - loss: 1.1015  
Epoch 5/100  
504/504 [=====] - 0s 93us/step - loss: 0.9981  
Epoch 6/100  
504/504 [=====] - 0s 93us/step - loss: 0.9107  
Epoch 7/100  
504/504 [=====] - 0s 93us/step - loss: 0.8357  
Epoch 8/100  
504/504 [=====] - 0s 93us/step - loss: 0.7676  
Epoch 9/100  
504/504 [=====] - 0s 93us/step - loss: 0.7075  
Epoch 10/100  
504/504 [=====] - 0s 93us/step - loss: 0.6563  
Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 0.6140  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 0.5745  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.5424  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.5133  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.4870  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.4657  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.4461  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.4301  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.4145  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.4030  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.3921  
Epoch 22/100  
504/504 [=====] - 0s 93us/step - loss: 0.3829  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.3744  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.3656  
Epoch 25/100  
504/504 [=====] - 0s 124us/step - loss: 0.3581  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.3509

Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.3444  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.3374  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3309  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3248  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3189  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.3129  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3073  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.3026  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.2977  
Epoch 36/100  
504/504 [=====] - 0s 62us/step - loss: 0.2937  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.2894  
Epoch 38/100  
504/504 [=====] - 0s 62us/step - loss: 0.2856  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.2815  
Epoch 40/100  
504/504 [=====] - 0s 62us/step - loss: 0.2772  
Epoch 41/100  
504/504 [=====] - 0s 124us/step - loss: 0.2737  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.2705  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.2670  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.2638  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.2612  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.2585  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.2560  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2532  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2505  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2479

Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.2449  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.2429  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2397  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2366  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2340  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2317  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2288  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2264  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2248  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2222  
Epoch 61/100  
504/504 [=====] - 0s 62us/step - loss: 0.2209  
Epoch 62/100  
504/504 [=====] - 0s 62us/step - loss: 0.2182  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2162  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2140  
Epoch 65/100  
504/504 [=====] - 0s 62us/step - loss: 0.2124  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2104  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2094  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2070  
Epoch 69/100  
504/504 [=====] - 0s 62us/step - loss: 0.2057  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2037  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2025  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.2011  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.1992  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.1978

Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.1963  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.1951  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.1932  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.1924  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.1907  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.1896  
Epoch 81/100  
504/504 [=====] - 0s 62us/step - loss: 0.1885  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.1870  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.1856  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.1849  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.1836  
Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.1823  
Epoch 87/100  
504/504 [=====] - 0s 93us/step - loss: 0.1817  
Epoch 88/100  
504/504 [=====] - 0s 124us/step - loss: 0.1805  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.1789  
Epoch 90/100  
504/504 [=====] - 0s 93us/step - loss: 0.1782  
Epoch 91/100  
504/504 [=====] - 0s 93us/step - loss: 0.1769  
Epoch 92/100  
504/504 [=====] - 0s 93us/step - loss: 0.1761  
Epoch 93/100  
504/504 [=====] - 0s 93us/step - loss: 0.1751  
Epoch 94/100  
504/504 [=====] - 0s 93us/step - loss: 0.1744  
Epoch 95/100  
504/504 [=====] - 0s 93us/step - loss: 0.1736  
Epoch 96/100  
504/504 [=====] - 0s 93us/step - loss: 0.1720  
Epoch 97/100  
504/504 [=====] - 0s 93us/step - loss: 0.1717  
Epoch 98/100  
504/504 [=====] - 0s 93us/step - loss: 0.1707

Epoch 99/100  
504/504 [=====] - 0s 93us/step - loss: 0.1702  
Epoch 100/100  
504/504 [=====] - 0s 93us/step - loss: 0.1692  
Epoch 1/100  
504/504 [=====] - 3s 7ms/step - loss: 2.0295  
Epoch 2/100  
504/504 [=====] - 0s 93us/step - loss: 1.7708  
Epoch 3/100  
504/504 [=====] - 0s 93us/step - loss: 1.5745  
Epoch 4/100  
504/504 [=====] - 0s 93us/step - loss: 1.4145  
Epoch 5/100  
504/504 [=====] - 0s 93us/step - loss: 1.2905  
Epoch 6/100  
504/504 [=====] - 0s 93us/step - loss: 1.1922  
Epoch 7/100  
504/504 [=====] - 0s 93us/step - loss: 1.1076  
Epoch 8/100  
504/504 [=====] - 0s 93us/step - loss: 1.0393  
Epoch 9/100  
504/504 [=====] - 0s 93us/step - loss: 0.9803  
Epoch 10/100  
504/504 [=====] - 0s 93us/step - loss: 0.9262  
Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 0.8816  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 0.8377  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.7998  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.7643  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.7333  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.7022  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.6741  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.6456  
Epoch 19/100  
504/504 [=====] - 0s 124us/step - loss: 0.6224  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.5980  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.5779  
Epoch 22/100  
504/504 [=====] - 0s 93us/step - loss: 0.5597

Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.5409  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.5253  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.5107  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.4969  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.4849  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.4731  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.4622  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.4521  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.4429  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.4338  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.4260  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.4180  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.4100  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.4035  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3958  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3892  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3828  
Epoch 40/100  
504/504 [=====] - 0s 124us/step - loss: 0.3770  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.3716  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.3657  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.3607  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.3553  
Epoch 45/100  
504/504 [=====] - 0s 124us/step - loss: 0.3508  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.3450



Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.3409  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.3368  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.3318  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.3276  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.3232  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.3188  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.3157  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.3122  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.3074  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.3037  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.3004  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2969  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2936  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2908  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.2868  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2837  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2809  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2773  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2748  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2721  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2690  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2662  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2632  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2612

```

Epoch 71/100
504/504 [=====] - 0s 124us/step - loss: 0.2583
Epoch 72/100
504/504 [=====] - 0s 93us/step - loss: 0.2561
Epoch 73/100
504/504 [=====] - 0s 93us/step - loss: 0.2538
Epoch 74/100
504/504 [=====] - 0s 93us/step - loss: 0.2511
Epoch 75/100
504/504 [=====] - 0s 93us/step - loss: 0.2488
Epoch 76/100
504/504 [=====] - 0s 124us/step - loss: 0.2465
Epoch 77/100
504/504 [=====] - 0s 93us/step - loss: 0.2443
Epoch 78/100
504/504 [=====] - 0s 93us/step - loss: 0.2421
Epoch 79/100
504/504 [=====] - 0s 93us/step - loss: 0.2402
Epoch 80/100
504/504 [=====] - 0s 93us/step - loss: 0.2383
Epoch 81/100
504/504 [=====] - ETA: 0s - loss: 0.205 - 0s 93us/step
- loss: 0.2367
Epoch 82/100
504/504 [=====] - 0s 93us/step - loss: 0.2345
Epoch 83/100
504/504 [=====] - 0s 93us/step - loss: 0.2327
Epoch 84/100
504/504 [=====] - 0s 93us/step - loss: 0.2310
Epoch 85/100
504/504 [=====] - 0s 93us/step - loss: 0.2288
Epoch 86/100
504/504 [=====] - 0s 93us/step - loss: 0.2275
Epoch 87/100
504/504 [=====] - 0s 93us/step - loss: 0.2259
Epoch 88/100
504/504 [=====] - 0s 93us/step - loss: 0.2237
Epoch 89/100
504/504 [=====] - 0s 93us/step - loss: 0.2219
Epoch 90/100
504/504 [=====] - 0s 93us/step - loss: 0.2209
Epoch 91/100
504/504 [=====] - 0s 94us/step - loss: 0.2190
Epoch 92/100
504/504 [=====] - 0s 93us/step - loss: 0.2168
Epoch 93/100
504/504 [=====] - 0s 62us/step - loss: 0.2144
Epoch 94/100

```

504/504 [=====] - 0s 93us/step - loss: 0.2132  
Epoch 95/100  
504/504 [=====] - 0s 62us/step - loss: 0.2114  
Epoch 96/100  
504/504 [=====] - 0s 124us/step - loss: 0.2097  
Epoch 97/100  
504/504 [=====] - 0s 62us/step - loss: 0.2072  
Epoch 98/100  
504/504 [=====] - 0s 93us/step - loss: 0.2058  
Epoch 99/100  
504/504 [=====] - 0s 93us/step - loss: 0.2045  
Epoch 100/100  
504/504 [=====] - 0s 93us/step - loss: 0.2011  
Epoch 1/100  
504/504 [=====] - 3s 7ms/step - loss: 1.6485  
Epoch 2/100  
504/504 [=====] - 0s 93us/step - loss: 1.4838  
Epoch 3/100  
504/504 [=====] - 0s 124us/step - loss: 1.3493  
Epoch 4/100  
504/504 [=====] - 0s 93us/step - loss: 1.2315  
Epoch 5/100  
504/504 [=====] - 0s 93us/step - loss: 1.1442  
Epoch 6/100  
504/504 [=====] - 0s 93us/step - loss: 1.0634  
Epoch 7/100  
504/504 [=====] - 0s 93us/step - loss: 0.9928  
Epoch 8/100  
504/504 [=====] - 0s 93us/step - loss: 0.9348  
Epoch 9/100  
504/504 [=====] - 0s 93us/step - loss: 0.8839  
Epoch 10/100  
504/504 [=====] - 0s 93us/step - loss: 0.8368  
Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 0.7965  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 0.7596  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.7279  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.6971  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.6706  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.6452  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.6234  
Epoch 18/100

504/504 [=====] - 0s 93us/step - loss: 0.6015  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.5826  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.5648  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.5483  
Epoch 22/100  
504/504 [=====] - 0s 93us/step - loss: 0.5333  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.5186  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.5044  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.4909  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.4782  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.4665  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.4536  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.4424  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.4316  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.4215  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.4109  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.4014  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.3927  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.3835  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.3743  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3658  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3574  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3490  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.3416  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.3351  
Epoch 42/100

504/504 [=====] - 0s 124us/step - loss: 0.3275  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.3212  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.3157  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.3107  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.3050  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.2999  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2956  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2912  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2870  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2830  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.2790  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2755  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2722  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2690  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2663  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2631  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2603  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2581  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2558  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2532  
Epoch 62/100  
504/504 [=====] - 0s 124us/step - loss: 0.2510  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2485  
Epoch 64/100  
504/504 [=====] - 0s 103us/step - loss: 0.2462  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2439  
Epoch 66/100

504/504 [=====] - 0s 93us/step - loss: 0.2420  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2398  
Epoch 68/100  
504/504 [=====] - 0s 124us/step - loss: 0.2383  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2358  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2342  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2325  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.2304  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2287  
Epoch 74/100  
504/504 [=====] - 0s 97us/step - loss: 0.2269  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.2256  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.2239  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.2224  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.2210  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.2199  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.2183  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.2170  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.2165  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.2151  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.2138  
Epoch 85/100  
504/504 [=====] - 0s 124us/step - loss: 0.2120  
Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.2114  
Epoch 87/100  
504/504 [=====] - 0s 93us/step - loss: 0.2100  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.2093  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.2079  
Epoch 90/100

504/504 [=====] - 0s 93us/step - loss: 0.2072  
 Epoch 91/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2066  
 Epoch 92/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2056  
 Epoch 93/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2043  
 Epoch 94/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2034  
 Epoch 95/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2026  
 Epoch 96/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2015  
 Epoch 97/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2006  
 Epoch 98/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2006  
 Epoch 99/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1990  
 Epoch 100/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1981  
 Epoch 1/100  
 504/504 [=====] - 3s 7ms/step - loss: 1.9756  
 Epoch 2/100  
 504/504 [=====] - 0s 93us/step - loss: 1.6561  
 Epoch 3/100  
 504/504 [=====] - 0s 93us/step - loss: 1.4321  
 Epoch 4/100  
 504/504 [=====] - 0s 124us/step - loss: 1.2557  
 Epoch 5/100  
 504/504 [=====] - 0s 93us/step - loss: 1.1261  
 Epoch 6/100  
 504/504 [=====] - 0s 93us/step - loss: 1.0306  
 Epoch 7/100  
 504/504 [=====] - 0s 93us/step - loss: 0.9482  
 Epoch 8/100  
 504/504 [=====] - 0s 93us/step - loss: 0.8864  
 Epoch 9/100  
 504/504 [=====] - 0s 124us/step - loss: 0.8331  
 Epoch 10/100  
 504/504 [=====] - 0s 93us/step - loss: 0.7889  
 Epoch 11/100  
 504/504 [=====] - 0s 93us/step - loss: 0.7522  
 Epoch 12/100  
 504/504 [=====] - 0s 93us/step - loss: 0.7193  
 Epoch 13/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6923  
 Epoch 14/100

504/504 [=====] - 0s 124us/step - loss: 0.6664  
Epoch 15/100  
504/504 [=====] - 0s 74us/step - loss: 0.6441  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.6227  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.6029  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.5839  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.5672  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.5522  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.5374  
Epoch 22/100  
504/504 [=====] - 0s 124us/step - loss: 0.5226  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.5088  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.4958  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.4837  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.4718  
Epoch 27/100  
504/504 [=====] - 0s 101us/step - loss: 0.4603  
Epoch 28/100  
504/504 [=====] - 0s 72us/step - loss: 0.4510  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.4414  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.4329  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.4249  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.4174  
Epoch 33/100  
504/504 [=====] - 0s 124us/step - loss: 0.4105  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.4037  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.3971  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.3907  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3850  
Epoch 38/100



504/504 [=====] - 0s 93us/step - loss: 0.3787  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3726  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.3670  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.3617  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.3572  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.3513  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.3465  
Epoch 45/100  
504/504 [=====] - 0s 124us/step - loss: 0.3416  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.3360  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.3310  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.3262  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.3211  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.3167  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.3128  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.3087  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.3046  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.3003  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2965  
Epoch 56/100  
504/504 [=====] - 0s 94us/step - loss: 0.2930  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2891  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2852  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2825  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2785  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2758  
Epoch 62/100

504/504 [=====] - 0s 93us/step - loss: 0.2725  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2692  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2661  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2626  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2592  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2562  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2530  
Epoch 69/100  
504/504 [=====] - 0s 124us/step - loss: 0.2497  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2470  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2444  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.2425  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2399  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.2380  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.2357  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.2338  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.2316  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.2301  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.2282  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.2260  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.2246  
Epoch 82/100  
504/504 [=====] - 0s 124us/step - loss: 0.2229  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.2215  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.2192  
Epoch 85/100  
504/504 [=====] - 0s 124us/step - loss: 0.2177  
Epoch 86/100

504/504 [=====] - 0s 93us/step - loss: 0.2163  
 Epoch 87/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2152  
 Epoch 88/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2133  
 Epoch 89/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2116  
 Epoch 90/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2101  
 Epoch 91/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2082  
 Epoch 92/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2068  
 Epoch 93/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2056  
 Epoch 94/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2048  
 Epoch 95/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2027  
 Epoch 96/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2021  
 Epoch 97/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2002  
 Epoch 98/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1997  
 Epoch 99/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1984  
 Epoch 100/100  
 504/504 [=====] - 0s 62us/step - loss: 0.1972  
 Epoch 1/100  
 504/504 [=====] - 4s 7ms/step - loss: 1.1472  
 Epoch 2/100  
 504/504 [=====] - 0s 124us/step - loss: 1.0452  
 Epoch 3/100  
 504/504 [=====] - 0s 126us/step - loss: 0.9611  
 Epoch 4/100  
 504/504 [=====] - 0s 93us/step - loss: 0.8916  
 Epoch 5/100  
 504/504 [=====] - 0s 124us/step - loss: 0.8303  
 Epoch 6/100  
 504/504 [=====] - 0s 93us/step - loss: 0.7800  
 Epoch 7/100  
 504/504 [=====] - 0s 93us/step - loss: 0.7343  
 Epoch 8/100  
 504/504 [=====] - 0s 124us/step - loss: 0.6963  
 Epoch 9/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6611  
 Epoch 10/100

504/504 [=====] - 0s 93us/step - loss: 0.6301  
 Epoch 11/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6015  
 Epoch 12/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5763  
 Epoch 13/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5528  
 Epoch 14/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5318  
 Epoch 15/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5105  
 Epoch 16/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4908  
 Epoch 17/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4716  
 Epoch 18/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4545  
 Epoch 19/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4385  
 Epoch 20/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4238  
 Epoch 21/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4101  
 Epoch 22/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3980  
 Epoch 23/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3859  
 Epoch 24/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3754  
 Epoch 25/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3666  
 Epoch 26/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3569  
 Epoch 27/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3483  
 Epoch 28/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3406  
 Epoch 29/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3337  
 Epoch 30/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3270  
 Epoch 31/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3202  
 Epoch 32/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3149  
 Epoch 33/100  
 504/504 [=====] - 0s 125us/step - loss: 0.3089  
 Epoch 34/100

504/504 [=====] - 0s 93us/step - loss: 0.3040  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.2990  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.2943  
Epoch 37/100  
504/504 [=====] - 0s 124us/step - loss: 0.2899  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.2857  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.2814  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.2774  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.2739  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.2701  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.2661  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.2626  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.2604  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.2563  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.2530  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2496  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2465  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2439  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2410  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.2376  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2350  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2321  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2296  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2267  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2244  
Epoch 58/100

504/504 [=====] - 0s 93us/step - loss: 0.2215  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2190  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2167  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2140  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2121  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2102  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2080  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2062  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2035  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2015  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.1997  
Epoch 69/100  
504/504 [=====] - 0s 124us/step - loss: 0.1976  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.1961  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.1941  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.1924  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.1911  
Epoch 74/100  
504/504 [=====] - 0s 124us/step - loss: 0.1893  
Epoch 75/100  
504/504 [=====] - 0s 124us/step - loss: 0.1879  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.1861  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.1849  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.1835  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.1821  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.1808  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.1795  
Epoch 82/100

504/504 [=====] - 0s 93us/step - loss: 0.1778  
 Epoch 83/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1769  
 Epoch 84/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1754  
 Epoch 85/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1749  
 Epoch 86/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1733  
 Epoch 87/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1720  
 Epoch 88/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1710  
 Epoch 89/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1699  
 Epoch 90/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1686  
 Epoch 91/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1678  
 Epoch 92/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1670  
 Epoch 93/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1653  
 Epoch 94/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1645  
 Epoch 95/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1646  
 Epoch 96/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1631  
 Epoch 97/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1619  
 Epoch 98/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1608  
 Epoch 99/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1607  
 Epoch 100/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1589  
 Epoch 1/100  
 504/504 [=====] - 5s 9ms/step - loss: 1.3638  
 Epoch 2/100  
 504/504 [=====] - 0s 93us/step - loss: 1.1661  
 Epoch 3/100  
 504/504 [=====] - 0s 93us/step - loss: 1.0080  
 Epoch 4/100  
 504/504 [=====] - 0s 93us/step - loss: 0.8801  
 Epoch 5/100  
 504/504 [=====] - 0s 124us/step - loss: 0.7791  
 Epoch 6/100

504/504 [=====] - 0s 93us/step - loss: 0.7059  
 Epoch 7/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6438  
 Epoch 8/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5984  
 Epoch 9/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5627  
 Epoch 10/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5355  
 Epoch 11/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5138  
 Epoch 12/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4976  
 Epoch 13/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4833  
 Epoch 14/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4709  
 Epoch 15/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4612  
 Epoch 16/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4517  
 Epoch 17/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4420  
 Epoch 18/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4339  
 Epoch 19/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4252  
 Epoch 20/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4177  
 Epoch 21/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4098  
 Epoch 22/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4019  
 Epoch 23/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3949  
 Epoch 24/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3875  
 Epoch 25/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3814  
 Epoch 26/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3747  
 Epoch 27/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3685  
 Epoch 28/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3628  
 Epoch 29/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3566  
 Epoch 30/100



504/504 [=====] - 0s 93us/step - loss: 0.3516  
Epoch 31/100  
504/504 [=====] - 0s 62us/step - loss: 0.3459  
Epoch 32/100  
504/504 [=====] - 0s 62us/step - loss: 0.3403  
Epoch 33/100  
504/504 [=====] - 0s 62us/step - loss: 0.3347  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.3301  
Epoch 35/100  
504/504 [=====] - 0s 124us/step - loss: 0.3248  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.3197  
Epoch 37/100  
504/504 [=====] - 0s 124us/step - loss: 0.3148  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3097  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3054  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.3005  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.2958  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.2914  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.2869  
Epoch 44/100  
504/504 [=====] - 0s 124us/step - loss: 0.2828  
Epoch 45/100  
504/504 [=====] - 0s 124us/step - loss: 0.2787  
Epoch 46/100  
504/504 [=====] - 0s 124us/step - loss: 0.2745  
Epoch 47/100  
504/504 [=====] - 0s 124us/step - loss: 0.2705  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2669  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2625  
Epoch 50/100  
504/504 [=====] - 0s 62us/step - loss: 0.2584  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2547  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.2509  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2474  
Epoch 54/100

504/504 [=====] - 0s 93us/step - loss: 0.2438  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2393  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2364  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2324  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2295  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2260  
Epoch 60/100  
504/504 [=====] - 0s 124us/step - loss: 0.2231  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.2195  
Epoch 62/100  
504/504 [=====] - 0s 124us/step - loss: 0.2167  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2140  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2108  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2085  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2054  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2029  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2006  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.1987  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.1958  
Epoch 71/100  
504/504 [=====] - 0s 124us/step - loss: 0.1938  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.1915  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.1896  
Epoch 74/100  
504/504 [=====] - 0s 124us/step - loss: 0.1876  
Epoch 75/100  
504/504 [=====] - 0s 124us/step - loss: 0.1859  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.1836  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.1817  
Epoch 78/100

504/504 [=====] - 0s 93us/step - loss: 0.1800  
 Epoch 79/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1784  
 Epoch 80/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1765  
 Epoch 81/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1752  
 Epoch 82/100  
 504/504 [=====] - 0s 125us/step - loss: 0.1736  
 Epoch 83/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1721  
 Epoch 84/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1707  
 Epoch 85/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1695  
 Epoch 86/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1682  
 Epoch 87/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1674  
 Epoch 88/100  
 504/504 [=====] - 0s 155us/step - loss: 0.1675  
 Epoch 89/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1663  
 Epoch 90/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1643  
 Epoch 91/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1629  
 Epoch 92/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1626  
 Epoch 93/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1615  
 Epoch 94/100  
 504/504 [=====] - 0s 62us/step - loss: 0.1611  
 Epoch 95/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1597  
 Epoch 96/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1593  
 Epoch 97/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1588  
 Epoch 98/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1582  
 Epoch 99/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1576  
 Epoch 100/100  
 504/504 [=====] - 0s 62us/step - loss: 0.1570  
 Epoch 1/100  
 504/504 [=====] - 4s 7ms/step - loss: 2.5857  
 Epoch 2/100

504/504 [=====] - 0s 93us/step - loss: 2.2655  
 Epoch 3/100  
 504/504 [=====] - 0s 127us/step - loss: 1.9739  
 Epoch 4/100  
 504/504 [=====] - 0s 93us/step - loss: 1.7415  
 Epoch 5/100  
 504/504 [=====] - 0s 93us/step - loss: 1.5451  
 Epoch 6/100  
 504/504 [=====] - 0s 93us/step - loss: 1.3788  
 Epoch 7/100  
 504/504 [=====] - 0s 93us/step - loss: 1.2447  
 Epoch 8/100  
 504/504 [=====] - 0s 93us/step - loss: 1.1280  
 Epoch 9/100  
 504/504 [=====] - 0s 93us/step - loss: 1.0325  
 Epoch 10/100  
 504/504 [=====] - 0s 93us/step - loss: 0.9492  
 Epoch 11/100  
 504/504 [=====] - 0s 93us/step - loss: 0.8779  
 Epoch 12/100  
 504/504 [=====] - 0s 93us/step - loss: 0.8176  
 Epoch 13/100  
 504/504 [=====] - 0s 93us/step - loss: 0.7644  
 Epoch 14/100  
 504/504 [=====] - 0s 93us/step - loss: 0.7193  
 Epoch 15/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6820  
 Epoch 16/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6477  
 Epoch 17/100  
 504/504 [=====] - 0s 62us/step - loss: 0.6192  
 Epoch 18/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5932  
 Epoch 19/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5698  
 Epoch 20/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5497  
 Epoch 21/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5309  
 Epoch 22/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5142  
 Epoch 23/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4989  
 Epoch 24/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4848  
 Epoch 25/100  
 504/504 [=====] - 0s 72us/step - loss: 0.4717  
 Epoch 26/100

504/504 [=====] - 0s 98us/step - loss: 0.4596  
 Epoch 27/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4481  
 Epoch 28/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4375  
 Epoch 29/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4275  
 Epoch 30/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4181  
 Epoch 31/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4095  
 Epoch 32/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4019  
 Epoch 33/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3942  
 Epoch 34/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3870  
 Epoch 35/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3808  
 Epoch 36/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3739  
 Epoch 37/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3682  
 Epoch 38/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3614  
 Epoch 39/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3558  
 Epoch 40/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3503  
 Epoch 41/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3452  
 Epoch 42/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3395  
 Epoch 43/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3350  
 Epoch 44/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3301  
 Epoch 45/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3263  
 Epoch 46/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3216  
 Epoch 47/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3174  
 Epoch 48/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3134  
 Epoch 49/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3094  
 Epoch 50/100

504/504 [=====] - 0s 93us/step - loss: 0.3059  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.3022  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.2987  
Epoch 53/100  
504/504 [=====] - 0s 124us/step - loss: 0.2953  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2916  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2882  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2850  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2820  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2789  
Epoch 59/100  
504/504 [=====] - 0s 124us/step - loss: 0.2762  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2730  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2703  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2674  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2648  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2625  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2595  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2572  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2550  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2530  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2503  
Epoch 70/100  
504/504 [=====] - 0s 124us/step - loss: 0.2482  
Epoch 71/100  
504/504 [=====] - 0s 98us/step - loss: 0.2461  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.2442  
Epoch 73/100  
504/504 [=====] - 0s 124us/step - loss: 0.2421  
Epoch 74/100

504/504 [=====] - 0s 93us/step - loss: 0.2404  
Epoch 75/100  
504/504 [=====] - 0s 124us/step - loss: 0.2378  
Epoch 76/100  
504/504 [=====] - 0s 155us/step - loss: 0.2361  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.2342  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.2323  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.2306  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.2292  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.2272  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.2260  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.2242  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.2228  
Epoch 85/100  
504/504 [=====] - 0s 124us/step - loss: 0.2214  
Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.2200  
Epoch 87/100  
504/504 [=====] - 0s 93us/step - loss: 0.2184  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.2166  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.2150  
Epoch 90/100  
504/504 [=====] - 0s 93us/step - loss: 0.2139  
Epoch 91/100  
504/504 [=====] - 0s 93us/step - loss: 0.2127  
Epoch 92/100  
504/504 [=====] - 0s 93us/step - loss: 0.2117  
Epoch 93/100  
504/504 [=====] - 0s 93us/step - loss: 0.2105  
Epoch 94/100  
504/504 [=====] - 0s 93us/step - loss: 0.2087  
Epoch 95/100  
504/504 [=====] - 0s 93us/step - loss: 0.2070  
Epoch 96/100  
504/504 [=====] - 0s 93us/step - loss: 0.2058  
Epoch 97/100  
504/504 [=====] - 0s 93us/step - loss: 0.2045  
Epoch 98/100

504/504 [=====] - 0s 93us/step - loss: 0.2043  
Epoch 99/100  
504/504 [=====] - 0s 93us/step - loss: 0.2022  
Epoch 100/100  
504/504 [=====] - 0s 93us/step - loss: 0.2008  
Epoch 1/100  
504/504 [=====] - 4s 7ms/step - loss: 3.5504  
Epoch 2/100  
504/504 [=====] - 0s 93us/step - loss: 3.0637  
Epoch 3/100  
504/504 [=====] - 0s 93us/step - loss: 2.6506  
Epoch 4/100  
504/504 [=====] - 0s 93us/step - loss: 2.3175  
Epoch 5/100  
504/504 [=====] - 0s 124us/step - loss: 2.0574  
Epoch 6/100  
504/504 [=====] - 0s 93us/step - loss: 1.8207  
Epoch 7/100  
504/504 [=====] - 0s 93us/step - loss: 1.6380  
Epoch 8/100  
504/504 [=====] - 0s 93us/step - loss: 1.4783  
Epoch 9/100  
504/504 [=====] - 0s 93us/step - loss: 1.3395  
Epoch 10/100  
504/504 [=====] - 0s 93us/step - loss: 1.2177  
Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 1.1158  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 1.0218  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.9388  
Epoch 14/100  
504/504 [=====] - 0s 124us/step - loss: 0.8658  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.8001  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.7400  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.6895  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.6442  
Epoch 19/100  
504/504 [=====] - 0s 124us/step - loss: 0.6044  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.5676  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.5368  
Epoch 22/100



504/504 [=====] - 0s 93us/step - loss: 0.5109  
Epoch 23/100  
504/504 [=====] - 0s 124us/step - loss: 0.4875  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.4670  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.4498  
Epoch 26/100  
504/504 [=====] - 0s 78us/step - loss: 0.4340  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.4208  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.4086  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3976  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3879  
Epoch 31/100  
504/504 [=====] - 0s 124us/step - loss: 0.3793  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.3713  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3633  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.3563  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.3499  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.3433  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3377  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3318  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3262  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.3209  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.3161  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.3109  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.3060  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.3016  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.2973  
Epoch 46/100

504/504 [=====] - 0s 93us/step - loss: 0.2931  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.2895  
Epoch 48/100  
504/504 [=====] - 0s 124us/step - loss: 0.2853  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2818  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2785  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2758  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.2722  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2690  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2661  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2634  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2604  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2578  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2557  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2529  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2507  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2483  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2461  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2441  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2424  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2401  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2384  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2365  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2346  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2327  
Epoch 70/100

504/504 [=====] - 0s 93us/step - loss: 0.2307  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2289  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.2273  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2253  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.2241  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.2221  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.2206  
Epoch 77/100  
504/504 [=====] - 0s 124us/step - loss: 0.2192  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.2172  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.2160  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.2141  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.2127  
Epoch 82/100  
504/504 [=====] - 0s 124us/step - loss: 0.2116  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.2100  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.2086  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.2072  
Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.2060  
Epoch 87/100  
504/504 [=====] - 0s 124us/step - loss: 0.2048  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.2035  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.2023  
Epoch 90/100  
504/504 [=====] - 0s 93us/step - loss: 0.2013  
Epoch 91/100  
504/504 [=====] - 0s 93us/step - loss: 0.2001  
Epoch 92/100  
504/504 [=====] - 0s 124us/step - loss: 0.1989  
Epoch 93/100  
504/504 [=====] - 0s 93us/step - loss: 0.1977  
Epoch 94/100

504/504 [=====] - 0s 93us/step - loss: 0.1969  
Epoch 95/100  
504/504 [=====] - 0s 93us/step - loss: 0.1956  
Epoch 96/100  
504/504 [=====] - 0s 93us/step - loss: 0.1949  
Epoch 97/100  
504/504 [=====] - 0s 93us/step - loss: 0.1936  
Epoch 98/100  
504/504 [=====] - 0s 93us/step - loss: 0.1928  
Epoch 99/100  
504/504 [=====] - 0s 124us/step - loss: 0.1918  
Epoch 100/100  
504/504 [=====] - 0s 124us/step - loss: 0.1914  
Epoch 1/100  
504/504 [=====] - 4s 8ms/step - loss: 1.0898  
Epoch 2/100  
504/504 [=====] - 0s 124us/step - loss: 0.9560  
Epoch 3/100  
504/504 [=====] - 0s 124us/step - loss: 0.8512  
Epoch 4/100  
504/504 [=====] - 0s 124us/step - loss: 0.7686  
Epoch 5/100  
504/504 [=====] - 0s 124us/step - loss: 0.6989  
Epoch 6/100  
504/504 [=====] - 0s 124us/step - loss: 0.6474  
Epoch 7/100  
504/504 [=====] - 0s 93us/step - loss: 0.6050  
Epoch 8/100  
504/504 [=====] - 0s 93us/step - loss: 0.5724  
Epoch 9/100  
504/504 [=====] - 0s 93us/step - loss: 0.5471  
Epoch 10/100  
504/504 [=====] - 0s 124us/step - loss: 0.5278  
Epoch 11/100  
504/504 [=====] - 0s 124us/step - loss: 0.5127  
Epoch 12/100  
504/504 [=====] - 0s 124us/step - loss: 0.5005  
Epoch 13/100  
504/504 [=====] - 0s 124us/step - loss: 0.4914  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.4820  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.4747  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.4684  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.4611  
Epoch 18/100

504/504 [=====] - 0s 93us/step - loss: 0.4551  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.4498  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.4440  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.4387  
Epoch 22/100  
504/504 [=====] - 0s 93us/step - loss: 0.4338  
Epoch 23/100  
504/504 [=====] - 0s 124us/step - loss: 0.4299  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.4256  
Epoch 25/100  
504/504 [=====] - 0s 124us/step - loss: 0.4211  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.4158  
Epoch 27/100  
504/504 [=====] - 0s 124us/step - loss: 0.4120  
Epoch 28/100  
504/504 [=====] - 0s 124us/step - loss: 0.4083  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.4018  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3961  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3906  
Epoch 32/100  
504/504 [=====] - 0s 94us/step - loss: 0.3855  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3800  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.3740  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.3676  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.3606  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3536  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3444  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3360  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.3279  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.3200  
Epoch 42/100

504/504 [=====] - 0s 93us/step - loss: 0.3118  
 Epoch 43/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3044  
 Epoch 44/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2971  
 Epoch 45/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2900  
 Epoch 46/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2842  
 Epoch 47/100  
 504/504 [=====] - 0s 104us/step - loss: 0.2784  
 Epoch 48/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2737  
 Epoch 49/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2684  
 Epoch 50/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2646  
 Epoch 51/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2602  
 Epoch 52/100  
 504/504 [=====] - 0s 96us/step - loss: 0.2553  
 Epoch 53/100  
 504/504 [=====] - 0s 128us/step - loss: 0.2513  
 Epoch 54/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2479  
 Epoch 55/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2440  
 Epoch 56/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2401  
 Epoch 57/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2369  
 Epoch 58/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2329  
 Epoch 59/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2300  
 Epoch 60/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2265  
 Epoch 61/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2233  
 Epoch 62/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2209  
 Epoch 63/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2182  
 Epoch 64/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2149  
 Epoch 65/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2123  
 Epoch 66/100

504/504 [=====] - 0s 124us/step - loss: 0.2102  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2073  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2053  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2036  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2010  
Epoch 71/100  
504/504 [=====] - 0s 124us/step - loss: 0.1986  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.1967  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.1942  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.1927  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.1901  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.1884  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.1864  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.1850  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.1830  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.1811  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.1799  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.1781  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.1763  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.1752  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.1735  
Epoch 86/100  
504/504 [=====] - 0s 124us/step - loss: 0.1722  
Epoch 87/100  
504/504 [=====] - 0s 93us/step - loss: 0.1708  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.1691  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.1675  
Epoch 90/100

504/504 [=====] - 0s 93us/step - loss: 0.1665  
 Epoch 91/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1659  
 Epoch 92/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1637  
 Epoch 93/100  
 504/504 [=====] - 0s 106us/step - loss: 0.1625  
 Epoch 94/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1612  
 Epoch 95/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1597  
 Epoch 96/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1588  
 Epoch 97/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1579  
 Epoch 98/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1574  
 Epoch 99/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1557  
 Epoch 100/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1550  
 Epoch 1/100  
 504/504 [=====] - 4s 7ms/step - loss: 1.5268  
 Epoch 2/100  
 504/504 [=====] - 0s 93us/step - loss: 1.3525  
 Epoch 3/100  
 504/504 [=====] - 0s 93us/step - loss: 1.2120  
 Epoch 4/100  
 504/504 [=====] - 0s 93us/step - loss: 1.0970  
 Epoch 5/100  
 504/504 [=====] - 0s 93us/step - loss: 1.0056  
 Epoch 6/100  
 504/504 [=====] - 0s 93us/step - loss: 0.9243  
 Epoch 7/100  
 504/504 [=====] - 0s 93us/step - loss: 0.8542  
 Epoch 8/100  
 504/504 [=====] - 0s 93us/step - loss: 0.7938  
 Epoch 9/100  
 504/504 [=====] - 0s 93us/step - loss: 0.7418  
 Epoch 10/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6957  
 Epoch 11/100  
 504/504 [=====] - 0s 124us/step - loss: 0.6547  
 Epoch 12/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6217  
 Epoch 13/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5924  
 Epoch 14/100



504/504 [=====] - 0s 93us/step - loss: 0.5684  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.5459  
Epoch 16/100  
504/504 [=====] - 0s 124us/step - loss: 0.5272  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.5093  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.4934  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.4807  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.4692  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.4565  
Epoch 22/100  
504/504 [=====] - 0s 72us/step - loss: 0.4463  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.4365  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.4276  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.4191  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.4109  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.4030  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.3960  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3882  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3816  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3751  
Epoch 32/100  
504/504 [=====] - 0s 124us/step - loss: 0.3694  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3632  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.3573  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.3520  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.3473  
Epoch 37/100  
504/504 [=====] - 0s 124us/step - loss: 0.3421  
Epoch 38/100

504/504 [=====] - 0s 93us/step - loss: 0.3377  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3326  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.3283  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.3241  
Epoch 42/100  
504/504 [=====] - 0s 124us/step - loss: 0.3203  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.3162  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.3124  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.3081  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.3042  
Epoch 47/100  
504/504 [=====] - 0s 124us/step - loss: 0.3012  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2973  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2929  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2893  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2862  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.2829  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2794  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2761  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2731  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2701  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2672  
Epoch 58/100  
504/504 [=====] - 0s 124us/step - loss: 0.2641  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2611  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2587  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2560  
Epoch 62/100

504/504 [=====] - 0s 93us/step - loss: 0.2532  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2505  
Epoch 64/100  
504/504 [=====] - 0s 124us/step - loss: 0.2485  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2458  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2434  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2412  
Epoch 68/100  
504/504 [=====] - 0s 124us/step - loss: 0.2387  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2367  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2346  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2321  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.2301  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2281  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.2261  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.2239  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.2218  
Epoch 77/100  
504/504 [=====] - 0s 124us/step - loss: 0.2198  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.2172  
Epoch 79/100  
504/504 [=====] - 0s 105us/step - loss: 0.2160  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.2131  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.2111  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.2090  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.2064  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.2047  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.2018  
Epoch 86/100

504/504 [=====] - 0s 100us/step - loss: 0.1996  
 Epoch 87/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1963  
 Epoch 88/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1941  
 Epoch 89/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1922  
 Epoch 90/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1900  
 Epoch 91/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1884  
 Epoch 92/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1872  
 Epoch 93/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1863  
 Epoch 94/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1842  
 Epoch 95/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1834  
 Epoch 96/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1820  
 Epoch 97/100  
 504/504 [=====] - 0s 155us/step - loss: 0.1803  
 Epoch 98/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1796  
 Epoch 99/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1785  
 Epoch 100/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1781  
 Epoch 1/100  
 504/504 [=====] - 4s 7ms/step - loss: 1.5587  
 Epoch 2/100  
 504/504 [=====] - 0s 93us/step - loss: 1.3853  
 Epoch 3/100  
 504/504 [=====] - 0s 93us/step - loss: 1.2393  
 Epoch 4/100  
 504/504 [=====] - 0s 93us/step - loss: 1.1209  
 Epoch 5/100  
 504/504 [=====] - 0s 93us/step - loss: 1.0203  
 Epoch 6/100  
 504/504 [=====] - 0s 93us/step - loss: 0.9361  
 Epoch 7/100  
 504/504 [=====] - 0s 93us/step - loss: 0.8596  
 Epoch 8/100  
 504/504 [=====] - 0s 93us/step - loss: 0.7984  
 Epoch 9/100  
 504/504 [=====] - 0s 100us/step - loss: 0.7421  
 Epoch 10/100

504/504 [=====] - 0s 93us/step - loss: 0.6910  
Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 0.6460  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 0.6082  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.5756  
Epoch 14/100  
504/504 [=====] - 0s 124us/step - loss: 0.5497  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.5267  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.5060  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.4904  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.4762  
Epoch 19/100  
504/504 [=====] - 0s 124us/step - loss: 0.4646  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.4538  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.4451  
Epoch 22/100  
504/504 [=====] - 0s 93us/step - loss: 0.4370  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.4294  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.4227  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.4159  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.4103  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.4031  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.3969  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3903  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3822  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3747  
Epoch 32/100  
504/504 [=====] - 0s 94us/step - loss: 0.3672  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3611  
Epoch 34/100

504/504 [=====] - 0s 99us/step - loss: 0.3548  
Epoch 35/100  
504/504 [=====] - 0s 124us/step - loss: 0.3504  
Epoch 36/100  
504/504 [=====] - 0s 100us/step - loss: 0.3438  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3390  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3335  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3289  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.3241  
Epoch 41/100  
504/504 [=====] - 0s 124us/step - loss: 0.3197  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.3151  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.3109  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.3067  
Epoch 45/100  
504/504 [=====] - 0s 96us/step - loss: 0.3031  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.2984  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.2946  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2910  
Epoch 49/100  
504/504 [=====] - 0s 124us/step - loss: 0.2879  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2841  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2807  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.2778  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2740  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2712  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2676  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2646  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2619  
Epoch 58/100

504/504 [=====] - 0s 93us/step - loss: 0.2587  
Epoch 59/100  
504/504 [=====] - 0s 124us/step - loss: 0.2557  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2530  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2500  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2479  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2447  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2421  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2397  
Epoch 66/100  
504/504 [=====] - 0s 124us/step - loss: 0.2371  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2344  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2323  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2299  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2272  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2252  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.2230  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2206  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.2192  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.2166  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.2148  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.2128  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.2112  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.2097  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.2078  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.2057  
Epoch 82/100

504/504 [=====] - 0s 93us/step - loss: 0.2041  
 Epoch 83/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2026  
 Epoch 84/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2012  
 Epoch 85/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1991  
 Epoch 86/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1980  
 Epoch 87/100  
 504/504 [=====] - 0s 70us/step - loss: 0.1970  
 Epoch 88/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1950  
 Epoch 89/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1949  
 Epoch 90/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1931  
 Epoch 91/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1915  
 Epoch 92/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1903  
 Epoch 93/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1887  
 Epoch 94/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1878  
 Epoch 95/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1864  
 Epoch 96/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1853  
 Epoch 97/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1843  
 Epoch 98/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1841  
 Epoch 99/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1828  
 Epoch 100/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1819  
 Epoch 1/100  
 504/504 [=====] - 4s 7ms/step - loss: 1.8647  
 Epoch 2/100  
 504/504 [=====] - 0s 93us/step - loss: 1.6058  
 Epoch 3/100  
 504/504 [=====] - 0s 93us/step - loss: 1.4076  
 Epoch 4/100  
 504/504 [=====] - 0s 93us/step - loss: 1.2440  
 Epoch 5/100  
 504/504 [=====] - 0s 93us/step - loss: 1.1210  
 Epoch 6/100



504/504 [=====] - 0s 93us/step - loss: 1.0199  
 Epoch 7/100  
 504/504 [=====] - 0s 93us/step - loss: 0.9393  
 Epoch 8/100  
 504/504 [=====] - 0s 124us/step - loss: 0.8702  
 Epoch 9/100  
 504/504 [=====] - 0s 93us/step - loss: 0.8108  
 Epoch 10/100  
 504/504 [=====] - 0s 93us/step - loss: 0.7579  
 Epoch 11/100  
 504/504 [=====] - 0s 124us/step - loss: 0.7132  
 Epoch 12/100  
 504/504 [=====] - 0s 124us/step - loss: 0.6705  
 Epoch 13/100  
 504/504 [=====] - 0s 155us/step - loss: 0.6336  
 Epoch 14/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6010  
 Epoch 15/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5699  
 Epoch 16/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5435  
 Epoch 17/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5201  
 Epoch 18/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4986  
 Epoch 19/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4822  
 Epoch 20/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4657  
 Epoch 21/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4516  
 Epoch 22/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4395  
 Epoch 23/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4286  
 Epoch 24/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4184  
 Epoch 25/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4088  
 Epoch 26/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4007  
 Epoch 27/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3918  
 Epoch 28/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3840  
 Epoch 29/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3765  
 Epoch 30/100

504/504 [=====] - 0s 93us/step - loss: 0.3695  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3629  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.3569  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3514  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.3458  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.3414  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.3359  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3311  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3263  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3221  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.3174  
Epoch 41/100  
504/504 [=====] - 0s 124us/step - loss: 0.3134  
Epoch 42/100  
504/504 [=====] - 0s 124us/step - loss: 0.3090  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.3042  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.3000  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.2958  
Epoch 46/100  
504/504 [=====] - 0s 124us/step - loss: 0.2923  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.2880  
Epoch 48/100  
504/504 [=====] - 0s 124us/step - loss: 0.2842  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2806  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2768  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2736  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.2700  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2666  
Epoch 54/100

504/504 [=====] - 0s 95us/step - loss: 0.2635  
 Epoch 55/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2611  
 Epoch 56/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2575  
 Epoch 57/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2545  
 Epoch 58/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2518  
 Epoch 59/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2486  
 Epoch 60/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2464  
 Epoch 61/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2433  
 Epoch 62/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2409  
 Epoch 63/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2383  
 Epoch 64/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2357  
 Epoch 65/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2335  
 Epoch 66/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2313  
 Epoch 67/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2292  
 Epoch 68/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2269  
 Epoch 69/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2246  
 Epoch 70/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2228  
 Epoch 71/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2209  
 Epoch 72/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2183  
 Epoch 73/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2167  
 Epoch 74/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2149  
 Epoch 75/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2130  
 Epoch 76/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2113  
 Epoch 77/100  
 504/504 [=====] - 0s 62us/step - loss: 0.2094  
 Epoch 78/100

504/504 [=====] - 0s 93us/step - loss: 0.2084  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.2063  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.2046  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.2039  
Epoch 82/100  
504/504 [=====] - 0s 124us/step - loss: 0.2017  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.2006  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.1990  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.1980  
Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.1964  
Epoch 87/100  
504/504 [=====] - 0s 93us/step - loss: 0.1953  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.1941  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.1932  
Epoch 90/100  
504/504 [=====] - 0s 124us/step - loss: 0.1918  
Epoch 91/100  
504/504 [=====] - 0s 93us/step - loss: 0.1913  
Epoch 92/100  
504/504 [=====] - 0s 93us/step - loss: 0.1906  
Epoch 93/100  
504/504 [=====] - 0s 93us/step - loss: 0.1894  
Epoch 94/100  
504/504 [=====] - 0s 102us/step - loss: 0.1880  
Epoch 95/100  
504/504 [=====] - 0s 93us/step - loss: 0.1876  
Epoch 96/100  
504/504 [=====] - 0s 93us/step - loss: 0.1866  
Epoch 97/100  
504/504 [=====] - 0s 93us/step - loss: 0.1858  
Epoch 98/100  
504/504 [=====] - 0s 93us/step - loss: 0.1853  
Epoch 99/100  
504/504 [=====] - 0s 93us/step - loss: 0.1842  
Epoch 100/100  
504/504 [=====] - 0s 93us/step - loss: 0.1834  
Epoch 1/100  
504/504 [=====] - 4s 8ms/step - loss: 1.3557  
Epoch 2/100

504/504 [=====] - 0s 95us/step - loss: 1.1925  
Epoch 3/100  
504/504 [=====] - 0s 102us/step - loss: 1.0602  
Epoch 4/100  
504/504 [=====] - 0s 93us/step - loss: 0.9523  
Epoch 5/100  
504/504 [=====] - 0s 93us/step - loss: 0.8641  
Epoch 6/100  
504/504 [=====] - 0s 124us/step - loss: 0.7920  
Epoch 7/100  
504/504 [=====] - 0s 93us/step - loss: 0.7332  
Epoch 8/100  
504/504 [=====] - 0s 93us/step - loss: 0.6803  
Epoch 9/100  
504/504 [=====] - 0s 93us/step - loss: 0.6364  
Epoch 10/100  
504/504 [=====] - 0s 93us/step - loss: 0.5993  
Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 0.5629  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 0.5315  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.5052  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.4822  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.4600  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.4422  
Epoch 17/100  
504/504 [=====] - 0s 97us/step - loss: 0.4254  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.4098  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.3958  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.3827  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.3720  
Epoch 22/100  
504/504 [=====] - 0s 93us/step - loss: 0.3610  
Epoch 23/100  
504/504 [=====] - 0s 98us/step - loss: 0.3513  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.3421  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.3334  
Epoch 26/100

504/504 [=====] - 0s 93us/step - loss: 0.3263  
 Epoch 27/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3183  
 Epoch 28/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3107  
 Epoch 29/100  
 504/504 [=====] - 0s 99us/step - loss: 0.3041  
 Epoch 30/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2970  
 Epoch 31/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2905  
 Epoch 32/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2848  
 Epoch 33/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2785  
 Epoch 34/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2728  
 Epoch 35/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2672  
 Epoch 36/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2617  
 Epoch 37/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2567  
 Epoch 38/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2514  
 Epoch 39/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2464  
 Epoch 40/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2423  
 Epoch 41/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2378  
 Epoch 42/100  
 504/504 [=====] - 0s 105us/step - loss: 0.2341  
 Epoch 43/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2304  
 Epoch 44/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2270  
 Epoch 45/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2230  
 Epoch 46/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2199  
 Epoch 47/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2171  
 Epoch 48/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2141  
 Epoch 49/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2114  
 Epoch 50/100

504/504 [=====] - 0s 93us/step - loss: 0.2094  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2066  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.2045  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2031  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2013  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.1998  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.1980  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.1961  
Epoch 58/100  
504/504 [=====] - 0s 97us/step - loss: 0.1951  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.1930  
Epoch 60/100  
504/504 [=====] - 0s 124us/step - loss: 0.1920  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.1912  
Epoch 62/100  
504/504 [=====] - 0s 124us/step - loss: 0.1895  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.1886  
Epoch 64/100  
504/504 [=====] - 0s 124us/step - loss: 0.1875  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.1861  
Epoch 66/100  
504/504 [=====] - 0s 155us/step - loss: 0.1849  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.1842  
Epoch 68/100  
504/504 [=====] - 0s 124us/step - loss: 0.1833  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.1823  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.1815  
Epoch 71/100  
504/504 [=====] - 0s 124us/step - loss: 0.1806  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.1795  
Epoch 73/100  
504/504 [=====] - 0s 155us/step - loss: 0.1793  
Epoch 74/100

504/504 [=====] - 0s 124us/step - loss: 0.1785  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.1776  
Epoch 76/100  
504/504 [=====] - 0s 155us/step - loss: 0.1767  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.1757  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.1753  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.1751  
Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.1737  
Epoch 81/100  
504/504 [=====] - 0s 155us/step - loss: 0.1729  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.1724  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.1716  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.1709  
Epoch 85/100  
504/504 [=====] - 0s 124us/step - loss: 0.1712  
Epoch 86/100  
504/504 [=====] - 0s 124us/step - loss: 0.1698  
Epoch 87/100  
504/504 [=====] - 0s 125us/step - loss: 0.1694  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.1688  
Epoch 89/100  
504/504 [=====] - 0s 124us/step - loss: 0.1679  
Epoch 90/100  
504/504 [=====] - 0s 124us/step - loss: 0.1679  
Epoch 91/100  
504/504 [=====] - 0s 93us/step - loss: 0.1664  
Epoch 92/100  
504/504 [=====] - 0s 93us/step - loss: 0.1662  
Epoch 93/100  
504/504 [=====] - 0s 124us/step - loss: 0.1660  
Epoch 94/100  
504/504 [=====] - 0s 124us/step - loss: 0.1651  
Epoch 95/100  
504/504 [=====] - 0s 155us/step - loss: 0.1646  
Epoch 96/100  
504/504 [=====] - 0s 124us/step - loss: 0.1642  
Epoch 97/100  
504/504 [=====] - 0s 93us/step - loss: 0.1644  
Epoch 98/100



504/504 [=====] - 0s 124us/step - loss: 0.1635  
Epoch 99/100  
504/504 [=====] - 0s 124us/step - loss: 0.1630  
Epoch 100/100  
504/504 [=====] - 0s 93us/step - loss: 0.1622  
Epoch 1/100  
504/504 [=====] - 4s 8ms/step - loss: 1.5657  
Epoch 2/100  
504/504 [=====] - 0s 124us/step - loss: 1.3551  
Epoch 3/100  
504/504 [=====] - 0s 93us/step - loss: 1.1776  
Epoch 4/100  
504/504 [=====] - 0s 124us/step - loss: 1.0392  
Epoch 5/100  
504/504 [=====] - 0s 93us/step - loss: 0.9218  
Epoch 6/100  
504/504 [=====] - 0s 93us/step - loss: 0.8263  
Epoch 7/100  
504/504 [=====] - 0s 93us/step - loss: 0.7478  
Epoch 8/100  
504/504 [=====] - 0s 93us/step - loss: 0.6830  
Epoch 9/100  
504/504 [=====] - 0s 93us/step - loss: 0.6300  
Epoch 10/100  
504/504 [=====] - 0s 93us/step - loss: 0.5840  
Epoch 11/100  
504/504 [=====] - 0s 124us/step - loss: 0.5469  
Epoch 12/100  
504/504 [=====] - 0s 124us/step - loss: 0.5159  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.4895  
Epoch 14/100  
504/504 [=====] - 0s 124us/step - loss: 0.4685  
Epoch 15/100  
504/504 [=====] - 0s 155us/step - loss: 0.4507  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.4357  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.4238  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.4136  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.4028  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.3938  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.3856  
Epoch 22/100

504/504 [=====] - 0s 93us/step - loss: 0.3773  
 Epoch 23/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3704  
 Epoch 24/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3627  
 Epoch 25/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3561  
 Epoch 26/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3499  
 Epoch 27/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3438  
 Epoch 28/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3373  
 Epoch 29/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3312  
 Epoch 30/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3257  
 Epoch 31/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3202  
 Epoch 32/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3145  
 Epoch 33/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3099  
 Epoch 34/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3047  
 Epoch 35/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3000  
 Epoch 36/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2953  
 Epoch 37/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2899  
 Epoch 38/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2852  
 Epoch 39/100  
 504/504 [=====] - 0s 102us/step - loss: 0.2812  
 Epoch 40/100  
 504/504 [=====] - 0s 102us/step - loss: 0.2770  
 Epoch 41/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2738  
 Epoch 42/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2691  
 Epoch 43/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2650  
 Epoch 44/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2614  
 Epoch 45/100  
 504/504 [=====] - 0s 155us/step - loss: 0.2570  
 Epoch 46/100

504/504 [=====] - 0s 124us/step - loss: 0.2538  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.2495  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2462  
Epoch 49/100  
504/504 [=====] - 0s 94us/step - loss: 0.2431  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2403  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.2365  
Epoch 52/100  
504/504 [=====] - 0s 155us/step - loss: 0.2338  
Epoch 53/100  
504/504 [=====] - 0s 155us/step - loss: 0.2307  
Epoch 54/100  
504/504 [=====] - 0s 124us/step - loss: 0.2277  
Epoch 55/100  
504/504 [=====] - 0s 124us/step - loss: 0.2251  
Epoch 56/100  
504/504 [=====] - 0s 124us/step - loss: 0.2221  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2193  
Epoch 58/100  
504/504 [=====] - 0s 124us/step - loss: 0.2168  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2141  
Epoch 60/100  
504/504 [=====] - 0s 124us/step - loss: 0.2120  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2098  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2070  
Epoch 63/100  
504/504 [=====] - 0s 99us/step - loss: 0.2048  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2028  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2006  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.1989  
Epoch 67/100  
504/504 [=====] - 0s 95us/step - loss: 0.1970  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.1953  
Epoch 69/100  
504/504 [=====] - 0s 105us/step - loss: 0.1937  
Epoch 70/100

504/504 [=====] - 0s 93us/step - loss: 0.1924  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.1907  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.1894  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.1875  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.1859  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.1844  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.1829  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.1813  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.1797  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.1784  
Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.1775  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.1769  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.1746  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.1733  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.1726  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.1711  
Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.1706  
Epoch 87/100  
504/504 [=====] - 0s 124us/step - loss: 0.1694  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.1685  
Epoch 89/100  
504/504 [=====] - 0s 124us/step - loss: 0.1681  
Epoch 90/100  
504/504 [=====] - 0s 124us/step - loss: 0.1664  
Epoch 91/100  
504/504 [=====] - 0s 124us/step - loss: 0.1657  
Epoch 92/100  
504/504 [=====] - 0s 155us/step - loss: 0.1649  
Epoch 93/100  
504/504 [=====] - 0s 93us/step - loss: 0.1644  
Epoch 94/100

504/504 [=====] - 0s 124us/step - loss: 0.1634  
Epoch 95/100  
504/504 [=====] - 0s 93us/step - loss: 0.1629  
Epoch 96/100  
504/504 [=====] - 0s 124us/step - loss: 0.1622  
Epoch 97/100  
504/504 [=====] - 0s 124us/step - loss: 0.1614  
Epoch 98/100  
504/504 [=====] - 0s 155us/step - loss: 0.1611  
Epoch 99/100  
504/504 [=====] - 0s 124us/step - loss: 0.1605  
Epoch 100/100  
504/504 [=====] - 0s 124us/step - loss: 0.1598  
Epoch 1/100  
504/504 [=====] - 4s 9ms/step - loss: 1.5551  
Epoch 2/100  
504/504 [=====] - 0s 155us/step - loss: 1.3079  
Epoch 3/100  
504/504 [=====] - 0s 124us/step - loss: 1.1334  
Epoch 4/100  
504/504 [=====] - 0s 93us/step - loss: 0.9860  
Epoch 5/100  
504/504 [=====] - 0s 98us/step - loss: 0.8838  
Epoch 6/100  
504/504 [=====] - 0s 93us/step - loss: 0.7995  
Epoch 7/100  
504/504 [=====] - 0s 155us/step - loss: 0.7374  
Epoch 8/100  
504/504 [=====] - 0s 124us/step - loss: 0.6857  
Epoch 9/100  
504/504 [=====] - 0s 124us/step - loss: 0.6457  
Epoch 10/100  
504/504 [=====] - 0s 124us/step - loss: 0.6117  
Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 0.5842  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 0.5616  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.5410  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.5227  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.5091  
Epoch 16/100  
504/504 [=====] - 0s 124us/step - loss: 0.4935  
Epoch 17/100  
504/504 [=====] - 0s 124us/step - loss: 0.4802  
Epoch 18/100

504/504 [=====] - 0s 124us/step - loss: 0.4691  
Epoch 19/100  
504/504 [=====] - 0s 124us/step - loss: 0.4585  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.4484  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.4396  
Epoch 22/100  
504/504 [=====] - 0s 124us/step - loss: 0.4311  
Epoch 23/100  
504/504 [=====] - 0s 124us/step - loss: 0.4232  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.4164  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.4097  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.4033  
Epoch 27/100  
504/504 [=====] - 0s 155us/step - loss: 0.3966  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.3909  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3849  
Epoch 30/100  
504/504 [=====] - 0s 124us/step - loss: 0.3799  
Epoch 31/100  
504/504 [=====] - 0s 124us/step - loss: 0.3745  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.3694  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3640  
Epoch 34/100  
504/504 [=====] - 0s 124us/step - loss: 0.3586  
Epoch 35/100  
504/504 [=====] - 0s 124us/step - loss: 0.3536  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.3487  
Epoch 37/100  
504/504 [=====] - 0s 124us/step - loss: 0.3442  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3398  
Epoch 39/100  
504/504 [=====] - 0s 124us/step - loss: 0.3352  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.3309  
Epoch 41/100  
504/504 [=====] - 0s 124us/step - loss: 0.3271  
Epoch 42/100

504/504 [=====] - 0s 124us/step - loss: 0.3230  
Epoch 43/100  
504/504 [=====] - 0s 124us/step - loss: 0.3188  
Epoch 44/100  
504/504 [=====] - 0s 124us/step - loss: 0.3153  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.3116  
Epoch 46/100  
504/504 [=====] - 0s 124us/step - loss: 0.3074  
Epoch 47/100  
504/504 [=====] - 0s 124us/step - loss: 0.3043  
Epoch 48/100  
504/504 [=====] - 0s 124us/step - loss: 0.3008  
Epoch 49/100  
504/504 [=====] - 0s 124us/step - loss: 0.2967  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2937  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.2903  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.2870  
Epoch 53/100  
504/504 [=====] - 0s 124us/step - loss: 0.2837  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2808  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2778  
Epoch 56/100  
504/504 [=====] - 0s 124us/step - loss: 0.2753  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2728  
Epoch 58/100  
504/504 [=====] - 0s 124us/step - loss: 0.2704  
Epoch 59/100  
504/504 [=====] - 0s 124us/step - loss: 0.2680  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2654  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2633  
Epoch 62/100  
504/504 [=====] - 0s 124us/step - loss: 0.2612  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2590  
Epoch 64/100  
504/504 [=====] - 0s 124us/step - loss: 0.2565  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2548  
Epoch 66/100

504/504 [=====] - 0s 124us/step - loss: 0.2525  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.2507  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2491  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2468  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2449  
Epoch 71/100  
504/504 [=====] - 0s 124us/step - loss: 0.2428  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.2409  
Epoch 73/100  
504/504 [=====] - 0s 124us/step - loss: 0.2388  
Epoch 74/100  
504/504 [=====] - 0s 124us/step - loss: 0.2384  
Epoch 75/100  
504/504 [=====] - 0s 124us/step - loss: 0.2351  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.2329  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.2310  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.2295  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.2274  
Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.2257  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.2236  
Epoch 82/100  
504/504 [=====] - 0s 124us/step - loss: 0.2217  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.2200  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.2188  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.2165  
Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.2154  
Epoch 87/100  
504/504 [=====] - 0s 124us/step - loss: 0.2141  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.2120  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.2104  
Epoch 90/100



504/504 [=====] - 0s 124us/step - loss: 0.2090  
 Epoch 91/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2076  
 Epoch 92/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2062  
 Epoch 93/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2047  
 Epoch 94/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2034  
 Epoch 95/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2023  
 Epoch 96/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2004  
 Epoch 97/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1995  
 Epoch 98/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1984  
 Epoch 99/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1969  
 Epoch 100/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1959  
 Epoch 1/100  
 504/504 [=====] - 4s 8ms/step - loss: 2.8149  
 Epoch 2/100  
 504/504 [=====] - 0s 93us/step - loss: 2.4479  
 Epoch 3/100  
 504/504 [=====] - 0s 93us/step - loss: 2.1504  
 Epoch 4/100  
 504/504 [=====] - 0s 93us/step - loss: 1.9020  
 Epoch 5/100  
 504/504 [=====] - 0s 124us/step - loss: 1.7074  
 Epoch 6/100  
 504/504 [=====] - 0s 93us/step - loss: 1.5471  
 Epoch 7/100  
 504/504 [=====] - 0s 93us/step - loss: 1.4151  
 Epoch 8/100  
 504/504 [=====] - 0s 124us/step - loss: 1.3026  
 Epoch 9/100  
 504/504 [=====] - 0s 93us/step - loss: 1.2060  
 Epoch 10/100  
 504/504 [=====] - 0s 93us/step - loss: 1.1238  
 Epoch 11/100  
 504/504 [=====] - 0s 93us/step - loss: 1.0534  
 Epoch 12/100  
 504/504 [=====] - 0s 93us/step - loss: 0.9891  
 Epoch 13/100  
 504/504 [=====] - 0s 93us/step - loss: 0.9265  
 Epoch 14/100

504/504 [=====] - 0s 93us/step - loss: 0.8732  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.8255  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.7787  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.7403  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.7043  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.6726  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.6444  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.6190  
Epoch 22/100  
504/504 [=====] - 0s 124us/step - loss: 0.5970  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.5760  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.5583  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.5408  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.5266  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.5138  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.5017  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.4911  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.4825  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.4735  
Epoch 32/100  
504/504 [=====] - 0s 124us/step - loss: 0.4654  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.4585  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.4516  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.4454  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.4389  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.4332  
Epoch 38/100

504/504 [=====] - 0s 101us/step - loss: 0.4274  
Epoch 39/100  
504/504 [=====] - 0s 124us/step - loss: 0.4227  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.4170  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.4118  
Epoch 42/100  
504/504 [=====] - 0s 107us/step - loss: 0.4071  
Epoch 43/100  
504/504 [=====] - 0s 105us/step - loss: 0.4024  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.3980  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.3936  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.3893  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.3848  
Epoch 48/100  
504/504 [=====] - 0s 124us/step - loss: 0.3809  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.3770  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.3730  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.3692  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.3659  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.3624  
Epoch 54/100  
504/504 [=====] - 0s 124us/step - loss: 0.3593  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.3552  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.3523  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.3485  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.3452  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.3418  
Epoch 60/100  
504/504 [=====] - 0s 124us/step - loss: 0.3388  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.3356  
Epoch 62/100

504/504 [=====] - 0s 93us/step - loss: 0.3329  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.3299  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.3264  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.3236  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.3210  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.3176  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.3150  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.3121  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.3100  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.3078  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.3040  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.3012  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.2989  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.2961  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.2930  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.2906  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.2879  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.2849  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.2824  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.2798  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.2765  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.2753  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.2707  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.2682  
Epoch 86/100

504/504 [=====] - 0s 93us/step - loss: 0.2652  
 Epoch 87/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2628  
 Epoch 88/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2596  
 Epoch 89/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2570  
 Epoch 90/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2532  
 Epoch 91/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2495  
 Epoch 92/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2456  
 Epoch 93/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2422  
 Epoch 94/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2394  
 Epoch 95/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2360  
 Epoch 96/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2333  
 Epoch 97/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2303  
 Epoch 98/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2275  
 Epoch 99/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2255  
 Epoch 100/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2228  
 Epoch 1/100  
 504/504 [=====] - 4s 9ms/step - loss: 1.1338  
 Epoch 2/100  
 504/504 [=====] - 0s 93us/step - loss: 1.0018  
 Epoch 3/100  
 504/504 [=====] - 0s 93us/step - loss: 0.9040  
 Epoch 4/100  
 504/504 [=====] - 0s 99us/step - loss: 0.8289  
 Epoch 5/100  
 504/504 [=====] - 0s 93us/step - loss: 0.7708  
 Epoch 6/100  
 504/504 [=====] - 0s 124us/step - loss: 0.7231  
 Epoch 7/100  
 504/504 [=====] - 0s 124us/step - loss: 0.6810  
 Epoch 8/100  
 504/504 [=====] - 0s 155us/step - loss: 0.6440  
 Epoch 9/100  
 504/504 [=====] - 0s 124us/step - loss: 0.6119  
 Epoch 10/100

504/504 [=====] - 0s 124us/step - loss: 0.5839  
Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 0.5591  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 0.5372  
Epoch 13/100  
504/504 [=====] - 0s 155us/step - loss: 0.5165  
Epoch 14/100  
504/504 [=====] - 0s 124us/step - loss: 0.4995  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.4835  
Epoch 16/100  
504/504 [=====] - 0s 124us/step - loss: 0.4687  
Epoch 17/100  
504/504 [=====] - 0s 124us/step - loss: 0.4554  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.4431  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.4321  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.4219  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.4133  
Epoch 22/100  
504/504 [=====] - 0s 155us/step - loss: 0.4042  
Epoch 23/100  
504/504 [=====] - 0s 124us/step - loss: 0.3957  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.3878  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.3802  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.3726  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.3652  
Epoch 28/100  
504/504 [=====] - 0s 155us/step - loss: 0.3586  
Epoch 29/100  
504/504 [=====] - 0s 124us/step - loss: 0.3511  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3456  
Epoch 31/100  
504/504 [=====] - 0s 124us/step - loss: 0.3389  
Epoch 32/100  
504/504 [=====] - 0s 124us/step - loss: 0.3326  
Epoch 33/100  
504/504 [=====] - 0s 155us/step - loss: 0.3272  
Epoch 34/100

504/504 [=====] - 0s 124us/step - loss: 0.3214  
Epoch 35/100  
504/504 [=====] - 0s 124us/step - loss: 0.3161  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.3114  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3068  
Epoch 38/100  
504/504 [=====] - 0s 155us/step - loss: 0.3022  
Epoch 39/100  
504/504 [=====] - 0s 124us/step - loss: 0.2985  
Epoch 40/100  
504/504 [=====] - 0s 124us/step - loss: 0.2940  
Epoch 41/100  
504/504 [=====] - 0s 124us/step - loss: 0.2909  
Epoch 42/100  
504/504 [=====] - 0s 94us/step - loss: 0.2866  
Epoch 43/100  
504/504 [=====] - 0s 124us/step - loss: 0.2824  
Epoch 44/100  
504/504 [=====] - 0s 124us/step - loss: 0.2784  
Epoch 45/100  
504/504 [=====] - 0s 155us/step - loss: 0.2745  
Epoch 46/100  
504/504 [=====] - 0s 124us/step - loss: 0.2711  
Epoch 47/100  
504/504 [=====] - 0s 124us/step - loss: 0.2672  
Epoch 48/100  
504/504 [=====] - 0s 124us/step - loss: 0.2637  
Epoch 49/100  
504/504 [=====] - 0s 155us/step - loss: 0.2602  
Epoch 50/100  
504/504 [=====] - 0s 124us/step - loss: 0.2570  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.2541  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.2509  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2480  
Epoch 54/100  
504/504 [=====] - 0s 124us/step - loss: 0.2448  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2425  
Epoch 56/100  
504/504 [=====] - 0s 124us/step - loss: 0.2396  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2374  
Epoch 58/100

504/504 [=====] - 0s 124us/step - loss: 0.2346  
Epoch 59/100  
504/504 [=====] - 0s 124us/step - loss: 0.2327  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2303  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.2281  
Epoch 62/100  
504/504 [=====] - 0s 124us/step - loss: 0.2264  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2240  
Epoch 64/100  
504/504 [=====] - 0s 124us/step - loss: 0.2223  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2205  
Epoch 66/100  
504/504 [=====] - 0s 124us/step - loss: 0.2179  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.2162  
Epoch 68/100  
504/504 [=====] - 0s 155us/step - loss: 0.2139  
Epoch 69/100  
504/504 [=====] - 0s 124us/step - loss: 0.2111  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2091  
Epoch 71/100  
504/504 [=====] - 0s 124us/step - loss: 0.2070  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.2052  
Epoch 73/100  
504/504 [=====] - 0s 158us/step - loss: 0.2036  
Epoch 74/100  
504/504 [=====] - 0s 155us/step - loss: 0.2019  
Epoch 75/100  
504/504 [=====] - 0s 124us/step - loss: 0.2000  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.1987  
Epoch 77/100  
504/504 [=====] - 0s 124us/step - loss: 0.1966  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.1950  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.1928  
Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.1905  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.1893  
Epoch 82/100



504/504 [=====] - 0s 124us/step - loss: 0.1872  
 Epoch 83/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1857  
 Epoch 84/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1844  
 Epoch 85/100  
 504/504 [=====] - 0s 155us/step - loss: 0.1829  
 Epoch 86/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1818  
 Epoch 87/100  
 504/504 [=====] - 0s 155us/step - loss: 0.1807  
 Epoch 88/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1796  
 Epoch 89/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1777  
 Epoch 90/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1768  
 Epoch 91/100  
 504/504 [=====] - 0s 155us/step - loss: 0.1755  
 Epoch 92/100  
 504/504 [=====] - 0s 155us/step - loss: 0.1742  
 Epoch 93/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1740  
 Epoch 94/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1727  
 Epoch 95/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1715  
 Epoch 96/100  
 504/504 [=====] - 0s 155us/step - loss: 0.1701  
 Epoch 97/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1695  
 Epoch 98/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1684  
 Epoch 99/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1673  
 Epoch 100/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1670  
 Epoch 1/100  
 504/504 [=====] - 5s 9ms/step - loss: 1.4384  
 Epoch 2/100  
 504/504 [=====] - 0s 93us/step - loss: 1.2803  
 Epoch 3/100  
 504/504 [=====] - 0s 93us/step - loss: 1.1501  
 Epoch 4/100  
 504/504 [=====] - 0s 93us/step - loss: 1.0440  
 Epoch 5/100  
 504/504 [=====] - 0s 133us/step - loss: 0.9516  
 Epoch 6/100

504/504 [=====] - 0s 124us/step - loss: 0.8759  
Epoch 7/100  
504/504 [=====] - 0s 124us/step - loss: 0.8056  
Epoch 8/100  
504/504 [=====] - 0s 124us/step - loss: 0.7462  
Epoch 9/100  
504/504 [=====] - 0s 124us/step - loss: 0.6967  
Epoch 10/100  
504/504 [=====] - 0s 124us/step - loss: 0.6534  
Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 0.6178  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 0.5867  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.5609  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.5406  
Epoch 15/100  
504/504 [=====] - 0s 124us/step - loss: 0.5215  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.5062  
Epoch 17/100  
504/504 [=====] - 0s 124us/step - loss: 0.4932  
Epoch 18/100  
504/504 [=====] - 0s 124us/step - loss: 0.4823  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.4710  
Epoch 20/100  
504/504 [=====] - 0s 124us/step - loss: 0.4621  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.4523  
Epoch 22/100  
504/504 [=====] - 0s 124us/step - loss: 0.4436  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.4356  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.4265  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.4177  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.4096  
Epoch 27/100  
504/504 [=====] - 0s 124us/step - loss: 0.4012  
Epoch 28/100  
504/504 [=====] - 0s 124us/step - loss: 0.3933  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3853  
Epoch 30/100

504/504 [=====] - 0s 124us/step - loss: 0.3777  
 Epoch 31/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3709  
 Epoch 32/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3640  
 Epoch 33/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3573  
 Epoch 34/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3512  
 Epoch 35/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3450  
 Epoch 36/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3394  
 Epoch 37/100  
 504/504 [=====] - 0s 104us/step - loss: 0.3333  
 Epoch 38/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3280  
 Epoch 39/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3225  
 Epoch 40/100  
 504/504 [=====] - 0s 186us/step - loss: 0.3170  
 Epoch 41/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3121  
 Epoch 42/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3077  
 Epoch 43/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3026  
 Epoch 44/100  
 504/504 [=====] - 0s 155us/step - loss: 0.2984  
 Epoch 45/100  
 504/504 [=====] - 0s 155us/step - loss: 0.2942  
 Epoch 46/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2902  
 Epoch 47/100  
 504/504 [=====] - 0s 155us/step - loss: 0.2864  
 Epoch 48/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2823  
 Epoch 49/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2786  
 Epoch 50/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2752  
 Epoch 51/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2714  
 Epoch 52/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2679  
 Epoch 53/100  
 504/504 [=====] - 0s 155us/step - loss: 0.2649  
 Epoch 54/100

504/504 [=====] - 0s 186us/step - loss: 0.2614  
Epoch 55/100  
504/504 [=====] - 0s 124us/step - loss: 0.2587  
Epoch 56/100  
504/504 [=====] - 0s 155us/step - loss: 0.2558  
Epoch 57/100  
504/504 [=====] - 0s 186us/step - loss: 0.2528  
Epoch 58/100  
504/504 [=====] - 0s 155us/step - loss: 0.2500  
Epoch 59/100  
504/504 [=====] - 0s 155us/step - loss: 0.2478  
Epoch 60/100  
504/504 [=====] - 0s 186us/step - loss: 0.2447  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.2420  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2397  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2371  
Epoch 64/100  
504/504 [=====] - 0s 155us/step - loss: 0.2347  
Epoch 65/100  
504/504 [=====] - 0s 186us/step - loss: 0.2326  
Epoch 66/100  
504/504 [=====] - 0s 155us/step - loss: 0.2300  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.2277  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2257  
Epoch 69/100  
504/504 [=====] - 0s 155us/step - loss: 0.2235  
Epoch 70/100  
504/504 [=====] - 0s 155us/step - loss: 0.2215  
Epoch 71/100  
504/504 [=====] - 0s 187us/step - loss: 0.2192  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.2174  
Epoch 73/100  
504/504 [=====] - 0s 124us/step - loss: 0.2157  
Epoch 74/100  
504/504 [=====] - 0s 186us/step - loss: 0.2140  
Epoch 75/100  
504/504 [=====] - 0s 155us/step - loss: 0.2128  
Epoch 76/100  
504/504 [=====] - 0s 155us/step - loss: 0.2103  
Epoch 77/100  
504/504 [=====] - 0s 155us/step - loss: 0.2088  
Epoch 78/100

504/504 [=====] - 0s 124us/step - loss: 0.2068  
 Epoch 79/100  
 504/504 [=====] - 0s 155us/step - loss: 0.2055  
 Epoch 80/100  
 504/504 [=====] - 0s 186us/step - loss: 0.2041  
 Epoch 81/100  
 504/504 [=====] - 0s 155us/step - loss: 0.2027  
 Epoch 82/100  
 504/504 [=====] - 0s 186us/step - loss: 0.2012  
 Epoch 83/100  
 504/504 [=====] - 0s 217us/step - loss: 0.1996  
 Epoch 84/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1988  
 Epoch 85/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1972  
 Epoch 86/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1961  
 Epoch 87/100  
 504/504 [=====] - 0s 186us/step - loss: 0.1956  
 Epoch 88/100  
 504/504 [=====] - 0s 217us/step - loss: 0.1939  
 Epoch 89/100  
 504/504 [=====] - 0s 155us/step - loss: 0.1926  
 Epoch 90/100  
 504/504 [=====] - 0s 186us/step - loss: 0.1914  
 Epoch 91/100  
 504/504 [=====] - 0s 155us/step - loss: 0.1905  
 Epoch 92/100  
 504/504 [=====] - 0s 217us/step - loss: 0.1899  
 Epoch 93/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1886  
 Epoch 94/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1874  
 Epoch 95/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1872  
 Epoch 96/100  
 504/504 [=====] - 0s 217us/step - loss: 0.1862  
 Epoch 97/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1852  
 Epoch 98/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1843  
 Epoch 99/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1832  
 Epoch 100/100  
 504/504 [=====] - 0s 217us/step - loss: 0.1826  
 Epoch 1/100  
 504/504 [=====] - 4s 8ms/step - loss: 2.1086  
 Epoch 2/100

504/504 [=====] - 0s 93us/step - loss: 1.7293  
 Epoch 3/100  
 504/504 [=====] - 0s 124us/step - loss: 1.4346  
 Epoch 4/100  
 504/504 [=====] - 0s 93us/step - loss: 1.2165  
 Epoch 5/100  
 504/504 [=====] - 0s 124us/step - loss: 1.0410  
 Epoch 6/100  
 504/504 [=====] - 0s 124us/step - loss: 0.9116  
 Epoch 7/100  
 504/504 [=====] - 0s 93us/step - loss: 0.8126  
 Epoch 8/100  
 504/504 [=====] - 0s 93us/step - loss: 0.7321  
 Epoch 9/100  
 504/504 [=====] - 0s 124us/step - loss: 0.6676  
 Epoch 10/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6119  
 Epoch 11/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5678  
 Epoch 12/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5294  
 Epoch 13/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4971  
 Epoch 14/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4712  
 Epoch 15/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4483  
 Epoch 16/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4287  
 Epoch 17/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4120  
 Epoch 18/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3970  
 Epoch 19/100  
 504/504 [=====] - 0s 97us/step - loss: 0.3833  
 Epoch 20/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3718  
 Epoch 21/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3614  
 Epoch 22/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3517  
 Epoch 23/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3429  
 Epoch 24/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3347  
 Epoch 25/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3271  
 Epoch 26/100

504/504 [=====] - 0s 93us/step - loss: 0.3210  
 Epoch 27/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3146  
 Epoch 28/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3086  
 Epoch 29/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3031  
 Epoch 30/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2976  
 Epoch 31/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2922  
 Epoch 32/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2872  
 Epoch 33/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2820  
 Epoch 34/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2771  
 Epoch 35/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2725  
 Epoch 36/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2681  
 Epoch 37/100  
 504/504 [=====] - 0s 155us/step - loss: 0.2640  
 Epoch 38/100  
 504/504 [=====] - 0s 186us/step - loss: 0.2601  
 Epoch 39/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2563  
 Epoch 40/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2523  
 Epoch 41/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2484  
 Epoch 42/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2449  
 Epoch 43/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2411  
 Epoch 44/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2385  
 Epoch 45/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2351  
 Epoch 46/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2308  
 Epoch 47/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2276  
 Epoch 48/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2243  
 Epoch 49/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2213  
 Epoch 50/100

504/504 [=====] - 0s 93us/step - loss: 0.2187  
 Epoch 51/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2164  
 Epoch 52/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2135  
 Epoch 53/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2112  
 Epoch 54/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2091  
 Epoch 55/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2067  
 Epoch 56/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2050  
 Epoch 57/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2038  
 Epoch 58/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2013  
 Epoch 59/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1997  
 Epoch 60/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1980  
 Epoch 61/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1973  
 Epoch 62/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1946  
 Epoch 63/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1931  
 Epoch 64/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1917  
 Epoch 65/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1905  
 Epoch 66/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1890  
 Epoch 67/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1881  
 Epoch 68/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1866  
 Epoch 69/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1862  
 Epoch 70/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1842  
 Epoch 71/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1836  
 Epoch 72/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1817  
 Epoch 73/100  
 504/504 [=====] - 0s 155us/step - loss: 0.1807  
 Epoch 74/100



504/504 [=====] - 0s 155us/step - loss: 0.1798  
 Epoch 75/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1789  
 Epoch 76/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1774  
 Epoch 77/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1767  
 Epoch 78/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1754  
 Epoch 79/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1746  
 Epoch 80/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1733  
 Epoch 81/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1726  
 Epoch 82/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1721  
 Epoch 83/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1709  
 Epoch 84/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1703  
 Epoch 85/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1691  
 Epoch 86/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1682  
 Epoch 87/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1676  
 Epoch 88/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1673  
 Epoch 89/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1660  
 Epoch 90/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1665  
 Epoch 91/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1648  
 Epoch 92/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1643  
 Epoch 93/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1635  
 Epoch 94/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1629  
 Epoch 95/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1620  
 Epoch 96/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1612  
 Epoch 97/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1611  
 Epoch 98/100

504/504 [=====] - 0s 93us/step - loss: 0.1602  
 Epoch 99/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1595  
 Epoch 100/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1587  
 Epoch 1/100  
 504/504 [=====] - 4s 8ms/step - loss: 1.6863  
 Epoch 2/100  
 504/504 [=====] - 0s 124us/step - loss: 1.4388  
 Epoch 3/100  
 504/504 [=====] - 0s 93us/step - loss: 1.2490  
 Epoch 4/100  
 504/504 [=====] - 0s 93us/step - loss: 1.1012  
 Epoch 5/100  
 504/504 [=====] - 0s 124us/step - loss: 0.9869  
 Epoch 6/100  
 504/504 [=====] - 0s 93us/step - loss: 0.8958  
 Epoch 7/100  
 504/504 [=====] - 0s 93us/step - loss: 0.8223  
 Epoch 8/100  
 504/504 [=====] - 0s 124us/step - loss: 0.7596  
 Epoch 9/100  
 504/504 [=====] - 0s 93us/step - loss: 0.7091  
 Epoch 10/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6656  
 Epoch 11/100  
 504/504 [=====] - 0s 124us/step - loss: 0.6288  
 Epoch 12/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5955  
 Epoch 13/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5669  
 Epoch 14/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5407  
 Epoch 15/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5184  
 Epoch 16/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4983  
 Epoch 17/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4803  
 Epoch 18/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4645  
 Epoch 19/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4497  
 Epoch 20/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4368  
 Epoch 21/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4254  
 Epoch 22/100

504/504 [=====] - 0s 93us/step - loss: 0.4148  
Epoch 23/100  
504/504 [=====] - 0s 108us/step - loss: 0.4058  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.3975  
Epoch 25/100  
504/504 [=====] - 0s 124us/step - loss: 0.3911  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.3838  
Epoch 27/100  
504/504 [=====] - 0s 124us/step - loss: 0.3760  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.3695  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3638  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3585  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3527  
Epoch 32/100  
504/504 [=====] - 0s 124us/step - loss: 0.3474  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3429  
Epoch 34/100  
504/504 [=====] - 0s 124us/step - loss: 0.3382  
Epoch 35/100  
504/504 [=====] - 0s 124us/step - loss: 0.3342  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.3321  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3267  
Epoch 38/100  
504/504 [=====] - 0s 124us/step - loss: 0.3233  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3201  
Epoch 40/100  
504/504 [=====] - 0s 124us/step - loss: 0.3163  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.3132  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.3108  
Epoch 43/100  
504/504 [=====] - 0s 124us/step - loss: 0.3067  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.3038  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.3009  
Epoch 46/100

504/504 [=====] - 0s 93us/step - loss: 0.2977  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.2964  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2929  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2903  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2882  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2860  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.2837  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2815  
Epoch 54/100  
504/504 [=====] - 0s 124us/step - loss: 0.2796  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2774  
Epoch 56/100  
504/504 [=====] - 0s 124us/step - loss: 0.2759  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2738  
Epoch 58/100  
504/504 [=====] - 0s 155us/step - loss: 0.2728  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2713  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2697  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.2678  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2668  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2651  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2632  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2625  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2612  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2596  
Epoch 68/100  
504/504 [=====] - 0s 124us/step - loss: 0.2585  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2573  
Epoch 70/100

504/504 [=====] - 0s 124us/step - loss: 0.2564  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2549  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.2540  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2523  
Epoch 74/100  
504/504 [=====] - 0s 124us/step - loss: 0.2514  
Epoch 75/100  
504/504 [=====] - 0s 124us/step - loss: 0.2500  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.2489  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.2474  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.2466  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.2455  
Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.2448  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.2437  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.2425  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.2419  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.2407  
Epoch 85/100  
504/504 [=====] - 0s 124us/step - loss: 0.2401  
Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.2385  
Epoch 87/100  
504/504 [=====] - 0s 124us/step - loss: 0.2378  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.2367  
Epoch 89/100  
504/504 [=====] - 0s 124us/step - loss: 0.2359  
Epoch 90/100  
504/504 [=====] - 0s 93us/step - loss: 0.2347  
Epoch 91/100  
504/504 [=====] - 0s 124us/step - loss: 0.2337  
Epoch 92/100  
504/504 [=====] - 0s 93us/step - loss: 0.2333  
Epoch 93/100  
504/504 [=====] - 0s 93us/step - loss: 0.2322  
Epoch 94/100

504/504 [=====] - 0s 124us/step - loss: 0.2313  
 Epoch 95/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2305  
 Epoch 96/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2298  
 Epoch 97/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2291  
 Epoch 98/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2281  
 Epoch 99/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2278  
 Epoch 100/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2264  
 Epoch 1/100  
 504/504 [=====] - 4s 8ms/step - loss: 1.9217  
 Epoch 2/100  
 504/504 [=====] - 0s 93us/step - loss: 1.6407  
 Epoch 3/100  
 504/504 [=====] - 0s 93us/step - loss: 1.4076  
 Epoch 4/100  
 504/504 [=====] - 0s 93us/step - loss: 1.2363  
 Epoch 5/100  
 504/504 [=====] - 0s 93us/step - loss: 1.1011  
 Epoch 6/100  
 504/504 [=====] - 0s 93us/step - loss: 0.9885  
 Epoch 7/100  
 504/504 [=====] - 0s 124us/step - loss: 0.8999  
 Epoch 8/100  
 504/504 [=====] - 0s 101us/step - loss: 0.8251  
 Epoch 9/100  
 504/504 [=====] - 0s 124us/step - loss: 0.7612  
 Epoch 10/100  
 504/504 [=====] - 0s 93us/step - loss: 0.7075  
 Epoch 11/100  
 504/504 [=====] - 0s 124us/step - loss: 0.6624  
 Epoch 12/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6236  
 Epoch 13/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5893  
 Epoch 14/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5588  
 Epoch 15/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5327  
 Epoch 16/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5101  
 Epoch 17/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4912  
 Epoch 18/100

504/504 [=====] - 0s 93us/step - loss: 0.4735  
Epoch 19/100  
504/504 [=====] - 0s 124us/step - loss: 0.4590  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.4454  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.4325  
Epoch 22/100  
504/504 [=====] - 0s 93us/step - loss: 0.4217  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.4116  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.4007  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.3922  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.3836  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.3759  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.3687  
Epoch 29/100  
504/504 [=====] - 0s 124us/step - loss: 0.3611  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3544  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3475  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.3409  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3345  
Epoch 34/100  
504/504 [=====] - 0s 124us/step - loss: 0.3283  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.3222  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.3156  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3103  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3047  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.2993  
Epoch 40/100  
504/504 [=====] - 0s 124us/step - loss: 0.2946  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.2896  
Epoch 42/100

504/504 [=====] - 0s 93us/step - loss: 0.2849  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.2803  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.2760  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.2716  
Epoch 46/100  
504/504 [=====] - 0s 124us/step - loss: 0.2675  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.2636  
Epoch 48/100  
504/504 [=====] - 0s 124us/step - loss: 0.2602  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2563  
Epoch 50/100  
504/504 [=====] - 0s 124us/step - loss: 0.2524  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2487  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.2455  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2423  
Epoch 54/100  
504/504 [=====] - 0s 124us/step - loss: 0.2390  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2356  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2325  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2296  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2270  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2248  
Epoch 60/100  
504/504 [=====] - 0s 124us/step - loss: 0.2220  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2195  
Epoch 62/100  
504/504 [=====] - 0s 124us/step - loss: 0.2173  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2154  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2132  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2104  
Epoch 66/100



504/504 [=====] - 0s 124us/step - loss: 0.2086  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2068  
Epoch 68/100  
504/504 [=====] - 0s 124us/step - loss: 0.2050  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2030  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2013  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.1994  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.1981  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.1970  
Epoch 74/100  
504/504 [=====] - 0s 124us/step - loss: 0.1952  
Epoch 75/100  
504/504 [=====] - 0s 124us/step - loss: 0.1935  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.1921  
Epoch 77/100  
504/504 [=====] - 0s 124us/step - loss: 0.1910  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.1897  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.1885  
Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.1872  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.1859  
Epoch 82/100  
504/504 [=====] - 0s 124us/step - loss: 0.1849  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.1843  
Epoch 84/100  
504/504 [=====] - 0s 124us/step - loss: 0.1828  
Epoch 85/100  
504/504 [=====] - 0s 124us/step - loss: 0.1816  
Epoch 86/100  
504/504 [=====] - 0s 124us/step - loss: 0.1801  
Epoch 87/100  
504/504 [=====] - 0s 124us/step - loss: 0.1791  
Epoch 88/100  
504/504 [=====] - 0s 124us/step - loss: 0.1786  
Epoch 89/100  
504/504 [=====] - 0s 124us/step - loss: 0.1772  
Epoch 90/100

504/504 [=====] - 0s 93us/step - loss: 0.1762  
 Epoch 91/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1760  
 Epoch 92/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1749  
 Epoch 93/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1730  
 Epoch 94/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1724  
 Epoch 95/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1717  
 Epoch 96/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1707  
 Epoch 97/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1703  
 Epoch 98/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1694  
 Epoch 99/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1686  
 Epoch 100/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1677  
 Epoch 1/100  
 504/504 [=====] - 4s 8ms/step - loss: 1.1959  
 Epoch 2/100  
 504/504 [=====] - 0s 124us/step - loss: 1.0250  
 Epoch 3/100  
 504/504 [=====] - 0s 93us/step - loss: 0.8975  
 Epoch 4/100  
 504/504 [=====] - 0s 124us/step - loss: 0.8046  
 Epoch 5/100  
 504/504 [=====] - 0s 93us/step - loss: 0.7307  
 Epoch 6/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6776  
 Epoch 7/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6307  
 Epoch 8/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5929  
 Epoch 9/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5630  
 Epoch 10/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5362  
 Epoch 11/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5145  
 Epoch 12/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4955  
 Epoch 13/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4793  
 Epoch 14/100

504/504 [=====] - 0s 93us/step - loss: 0.4661  
Epoch 15/100  
504/504 [=====] - 0s 124us/step - loss: 0.4536  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.4426  
Epoch 17/100  
504/504 [=====] - 0s 124us/step - loss: 0.4339  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.4243  
Epoch 19/100  
504/504 [=====] - 0s 124us/step - loss: 0.4159  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.4077  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.4004  
Epoch 22/100  
504/504 [=====] - 0s 124us/step - loss: 0.3927  
Epoch 23/100  
504/504 [=====] - 0s 124us/step - loss: 0.3851  
Epoch 24/100  
504/504 [=====] - 0s 155us/step - loss: 0.3783  
Epoch 25/100  
504/504 [=====] - 0s 124us/step - loss: 0.3712  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.3644  
Epoch 27/100  
504/504 [=====] - 0s 124us/step - loss: 0.3583  
Epoch 28/100  
504/504 [=====] - 0s 124us/step - loss: 0.3517  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3456  
Epoch 30/100  
504/504 [=====] - 0s 124us/step - loss: 0.3387  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3328  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.3272  
Epoch 33/100  
504/504 [=====] - 0s 125us/step - loss: 0.3216  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.3163  
Epoch 35/100  
504/504 [=====] - 0s 124us/step - loss: 0.3114  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.3062  
Epoch 37/100  
504/504 [=====] - 0s 124us/step - loss: 0.3015  
Epoch 38/100

504/504 [=====] - 0s 93us/step - loss: 0.2970  
 Epoch 39/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2928  
 Epoch 40/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2885  
 Epoch 41/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2846  
 Epoch 42/100  
 504/504 [=====] - 0s 155us/step - loss: 0.2811  
 Epoch 43/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2782  
 Epoch 44/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2747  
 Epoch 45/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2713  
 Epoch 46/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2686  
 Epoch 47/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2662  
 Epoch 48/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2631  
 Epoch 49/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2610  
 Epoch 50/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2585  
 Epoch 51/100  
 504/504 [=====] - 0s 155us/step - loss: 0.2557  
 Epoch 52/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2536  
 Epoch 53/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2513  
 Epoch 54/100  
 504/504 [=====] - 0s 186us/step - loss: 0.2492  
 Epoch 55/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2469  
 Epoch 56/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2443  
 Epoch 57/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2420  
 Epoch 58/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2399  
 Epoch 59/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2372  
 Epoch 60/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2349  
 Epoch 61/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2325  
 Epoch 62/100

504/504 [=====] - 0s 93us/step - loss: 0.2300  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2273  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2255  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2235  
Epoch 66/100  
504/504 [=====] - 0s 124us/step - loss: 0.2214  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2202  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2173  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2159  
Epoch 70/100  
504/504 [=====] - 0s 124us/step - loss: 0.2142  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2127  
Epoch 72/100  
504/504 [=====] - 0s 127us/step - loss: 0.2110  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2093  
Epoch 74/100  
504/504 [=====] - 0s 124us/step - loss: 0.2079  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.2069  
Epoch 76/100  
504/504 [=====] - 0s 115us/step - loss: 0.2054  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.2035  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.2021  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.2009  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.1999  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.1984  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.1978  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.1961  
Epoch 84/100  
504/504 [=====] - 0s 124us/step - loss: 0.1947  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.1934  
Epoch 86/100

504/504 [=====] - 0s 124us/step - loss: 0.1925  
 Epoch 87/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1914  
 Epoch 88/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1900  
 Epoch 89/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1887  
 Epoch 90/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1879  
 Epoch 91/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1863  
 Epoch 92/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1851  
 Epoch 93/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1839  
 Epoch 94/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1838  
 Epoch 95/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1818  
 Epoch 96/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1812  
 Epoch 97/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1805  
 Epoch 98/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1787  
 Epoch 99/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1780  
 Epoch 100/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1773  
 Epoch 1/100  
 504/504 [=====] - 4s 8ms/step - loss: 2.0953  
 Epoch 2/100  
 504/504 [=====] - 0s 93us/step - loss: 1.8637  
 Epoch 3/100  
 504/504 [=====] - 0s 124us/step - loss: 1.6707  
 Epoch 4/100  
 504/504 [=====] - 0s 93us/step - loss: 1.5153  
 Epoch 5/100  
 504/504 [=====] - 0s 124us/step - loss: 1.3810  
 Epoch 6/100  
 504/504 [=====] - 0s 93us/step - loss: 1.2668  
 Epoch 7/100  
 504/504 [=====] - 0s 124us/step - loss: 1.1655  
 Epoch 8/100  
 504/504 [=====] - 0s 93us/step - loss: 1.0799  
 Epoch 9/100  
 504/504 [=====] - 0s 93us/step - loss: 1.0003  
 Epoch 10/100

504/504 [=====] - 0s 93us/step - loss: 0.9307  
Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 0.8685  
Epoch 12/100  
504/504 [=====] - 0s 124us/step - loss: 0.8119  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.7609  
Epoch 14/100  
504/504 [=====] - 0s 124us/step - loss: 0.7178  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.6754  
Epoch 16/100  
504/504 [=====] - 0s 124us/step - loss: 0.6400  
Epoch 17/100  
504/504 [=====] - 0s 93us/step - loss: 0.6092  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.5821  
Epoch 19/100  
504/504 [=====] - 0s 138us/step - loss: 0.5584  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.5382  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.5217  
Epoch 22/100  
504/504 [=====] - 0s 104us/step - loss: 0.5069  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.4946  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.4836  
Epoch 25/100  
504/504 [=====] - 0s 93us/step - loss: 0.4730  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.4638  
Epoch 27/100  
504/504 [=====] - 0s 124us/step - loss: 0.4553  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.4480  
Epoch 29/100  
504/504 [=====] - 0s 124us/step - loss: 0.4401  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.4326  
Epoch 31/100  
504/504 [=====] - 0s 124us/step - loss: 0.4256  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.4191  
Epoch 33/100  
504/504 [=====] - 0s 124us/step - loss: 0.4124  
Epoch 34/100

504/504 [=====] - 0s 95us/step - loss: 0.4060  
Epoch 35/100  
504/504 [=====] - 0s 124us/step - loss: 0.4000  
Epoch 36/100  
504/504 [=====] - 0s 103us/step - loss: 0.3937  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3875  
Epoch 38/100  
504/504 [=====] - 0s 124us/step - loss: 0.3816  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3754  
Epoch 40/100  
504/504 [=====] - 0s 124us/step - loss: 0.3689  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.3633  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.3577  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.3525  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.3471  
Epoch 45/100  
504/504 [=====] - 0s 124us/step - loss: 0.3416  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.3363  
Epoch 47/100  
504/504 [=====] - 0s 124us/step - loss: 0.3311  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.3256  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.3199  
Epoch 50/100  
504/504 [=====] - 0s 124us/step - loss: 0.3147  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.3093  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.3044  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2989  
Epoch 54/100  
504/504 [=====] - 0s 124us/step - loss: 0.2944  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2893  
Epoch 56/100  
504/504 [=====] - 0s 124us/step - loss: 0.2840  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2796  
Epoch 58/100



504/504 [=====] - 0s 117us/step - loss: 0.2750  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.2712  
Epoch 60/100  
504/504 [=====] - 0s 124us/step - loss: 0.2666  
Epoch 61/100  
504/504 [=====] - 0s 93us/step - loss: 0.2628  
Epoch 62/100  
504/504 [=====] - 0s 124us/step - loss: 0.2589  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2556  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2520  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2486  
Epoch 66/100  
504/504 [=====] - 0s 124us/step - loss: 0.2450  
Epoch 67/100  
504/504 [=====] - 0s 155us/step - loss: 0.2419  
Epoch 68/100  
504/504 [=====] - 0s 124us/step - loss: 0.2384  
Epoch 69/100  
504/504 [=====] - 0s 155us/step - loss: 0.2352  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2319  
Epoch 71/100  
504/504 [=====] - 0s 124us/step - loss: 0.2291  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.2264  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2235  
Epoch 74/100  
504/504 [=====] - 0s 124us/step - loss: 0.2207  
Epoch 75/100  
504/504 [=====] - 0s 94us/step - loss: 0.2181  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.2154  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.2130  
Epoch 78/100  
504/504 [=====] - 0s 155us/step - loss: 0.2109  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.2088  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.2066  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.2046  
Epoch 82/100

504/504 [=====] - 0s 93us/step - loss: 0.2026  
 Epoch 83/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2007  
 Epoch 84/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1988  
 Epoch 85/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1973  
 Epoch 86/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1953  
 Epoch 87/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1937  
 Epoch 88/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1914  
 Epoch 89/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1897  
 Epoch 90/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1881  
 Epoch 91/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1867  
 Epoch 92/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1854  
 Epoch 93/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1838  
 Epoch 94/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1821  
 Epoch 95/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1812  
 Epoch 96/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1800  
 Epoch 97/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1782  
 Epoch 98/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1775  
 Epoch 99/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1761  
 Epoch 100/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1750  
 Epoch 1/100  
 504/504 [=====] - 4s 9ms/step - loss: 3.1000  
 Epoch 2/100  
 504/504 [=====] - 0s 93us/step - loss: 2.6553  
 Epoch 3/100  
 504/504 [=====] - 0s 129us/step - loss: 2.2861  
 Epoch 4/100  
 504/504 [=====] - 0s 93us/step - loss: 1.9862  
 Epoch 5/100  
 504/504 [=====] - 0s 93us/step - loss: 1.7421  
 Epoch 6/100

504/504 [=====] - 0s 124us/step - loss: 1.5363  
Epoch 7/100  
504/504 [=====] - 0s 93us/step - loss: 1.3717  
Epoch 8/100  
504/504 [=====] - 0s 124us/step - loss: 1.2375  
Epoch 9/100  
504/504 [=====] - 0s 93us/step - loss: 1.1181  
Epoch 10/100  
504/504 [=====] - 0s 124us/step - loss: 1.0237  
Epoch 11/100  
504/504 [=====] - 0s 124us/step - loss: 0.9394  
Epoch 12/100  
504/504 [=====] - 0s 93us/step - loss: 0.8695  
Epoch 13/100  
504/504 [=====] - 0s 124us/step - loss: 0.8050  
Epoch 14/100  
504/504 [=====] - 0s 93us/step - loss: 0.7491  
Epoch 15/100  
504/504 [=====] - 0s 124us/step - loss: 0.7010  
Epoch 16/100  
504/504 [=====] - 0s 93us/step - loss: 0.6573  
Epoch 17/100  
504/504 [=====] - 0s 124us/step - loss: 0.6183  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.5836  
Epoch 19/100  
504/504 [=====] - 0s 112us/step - loss: 0.5538  
Epoch 20/100  
504/504 [=====] - 0s 93us/step - loss: 0.5275  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.5035  
Epoch 22/100  
504/504 [=====] - 0s 124us/step - loss: 0.4840  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.4646  
Epoch 24/100  
504/504 [=====] - 0s 93us/step - loss: 0.4477  
Epoch 25/100  
504/504 [=====] - 0s 138us/step - loss: 0.4324  
Epoch 26/100  
504/504 [=====] - 0s 93us/step - loss: 0.4177  
Epoch 27/100  
504/504 [=====] - 0s 98us/step - loss: 0.4045  
Epoch 28/100  
504/504 [=====] - 0s 124us/step - loss: 0.3926  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3819  
Epoch 30/100

504/504 [=====] - 0s 124us/step - loss: 0.3714  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3622  
Epoch 32/100  
504/504 [=====] - 0s 124us/step - loss: 0.3537  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3461  
Epoch 34/100  
504/504 [=====] - 0s 124us/step - loss: 0.3383  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.3316  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.3249  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3189  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3128  
Epoch 39/100  
504/504 [=====] - 0s 124us/step - loss: 0.3068  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.3012  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.2956  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.2897  
Epoch 43/100  
504/504 [=====] - 0s 124us/step - loss: 0.2841  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.2786  
Epoch 45/100  
504/504 [=====] - 0s 124us/step - loss: 0.2736  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.2693  
Epoch 47/100  
504/504 [=====] - 0s 125us/step - loss: 0.2645  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2603  
Epoch 49/100  
504/504 [=====] - 0s 124us/step - loss: 0.2561  
Epoch 50/100  
504/504 [=====] - 0s 96us/step - loss: 0.2518  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2481  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.2453  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.2416  
Epoch 54/100

504/504 [=====] - 0s 124us/step - loss: 0.2385  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2344  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2316  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2283  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2255  
Epoch 59/100  
504/504 [=====] - 0s 124us/step - loss: 0.2224  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2194  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.2174  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2144  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2121  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2101  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2081  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2058  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.2036  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2016  
Epoch 69/100  
504/504 [=====] - 0s 124us/step - loss: 0.1996  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.1978  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.1956  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.1939  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.1925  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.1905  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.1887  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.1875  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.1861  
Epoch 78/100

504/504 [=====] - 0s 124us/step - loss: 0.1847  
 Epoch 79/100  
 504/504 [=====] - 0s 102us/step - loss: 0.1830  
 Epoch 80/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1821  
 Epoch 81/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1803  
 Epoch 82/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1791  
 Epoch 83/100  
 504/504 [=====] - 0s 126us/step - loss: 0.1781  
 Epoch 84/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1768  
 Epoch 85/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1756  
 Epoch 86/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1748  
 Epoch 87/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1733  
 Epoch 88/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1721  
 Epoch 89/100  
 504/504 [=====] - 0s 95us/step - loss: 0.1709  
 Epoch 90/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1703  
 Epoch 91/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1688  
 Epoch 92/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1676  
 Epoch 93/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1665  
 Epoch 94/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1655  
 Epoch 95/100  
 504/504 [=====] - 0s 131us/step - loss: 0.1644  
 Epoch 96/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1639  
 Epoch 97/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1629  
 Epoch 98/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1621  
 Epoch 99/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1611  
 Epoch 100/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1604  
 Epoch 1/100  
 504/504 [=====] - 4s 8ms/step - loss: 1.2741  
 Epoch 2/100

504/504 [=====] - 0s 155us/step - loss: 1.1209  
Epoch 3/100  
504/504 [=====] - 0s 124us/step - loss: 0.9800  
Epoch 4/100  
504/504 [=====] - 0s 93us/step - loss: 0.8627  
Epoch 5/100  
504/504 [=====] - 0s 124us/step - loss: 0.7649  
Epoch 6/100  
504/504 [=====] - 0s 102us/step - loss: 0.6903  
Epoch 7/100  
504/504 [=====] - 0s 136us/step - loss: 0.6335  
Epoch 8/100  
504/504 [=====] - 0s 124us/step - loss: 0.5915  
Epoch 9/100  
504/504 [=====] - 0s 124us/step - loss: 0.5604  
Epoch 10/100  
504/504 [=====] - 0s 124us/step - loss: 0.5374  
Epoch 11/100  
504/504 [=====] - 0s 124us/step - loss: 0.5194  
Epoch 12/100  
504/504 [=====] - 0s 124us/step - loss: 0.5060  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.4941  
Epoch 14/100  
504/504 [=====] - 0s 124us/step - loss: 0.4845  
Epoch 15/100  
504/504 [=====] - 0s 124us/step - loss: 0.4771  
Epoch 16/100  
504/504 [=====] - 0s 155us/step - loss: 0.4682  
Epoch 17/100  
504/504 [=====] - 0s 124us/step - loss: 0.4621  
Epoch 18/100  
504/504 [=====] - 0s 124us/step - loss: 0.4562  
Epoch 19/100  
504/504 [=====] - 0s 93us/step - loss: 0.4502  
Epoch 20/100  
504/504 [=====] - 0s 124us/step - loss: 0.4437  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.4380  
Epoch 22/100  
504/504 [=====] - 0s 124us/step - loss: 0.4321  
Epoch 23/100  
504/504 [=====] - 0s 155us/step - loss: 0.4267  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.4218  
Epoch 25/100  
504/504 [=====] - 0s 124us/step - loss: 0.4157  
Epoch 26/100

504/504 [=====] - 0s 124us/step - loss: 0.4109  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.4057  
Epoch 28/100  
504/504 [=====] - 0s 124us/step - loss: 0.4000  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3950  
Epoch 30/100  
504/504 [=====] - 0s 155us/step - loss: 0.3904  
Epoch 31/100  
504/504 [=====] - 0s 155us/step - loss: 0.3855  
Epoch 32/100  
504/504 [=====] - 0s 124us/step - loss: 0.3808  
Epoch 33/100  
504/504 [=====] - 0s 124us/step - loss: 0.3754  
Epoch 34/100  
504/504 [=====] - 0s 124us/step - loss: 0.3710  
Epoch 35/100  
504/504 [=====] - 0s 93us/step - loss: 0.3664  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.3609  
Epoch 37/100  
504/504 [=====] - 0s 124us/step - loss: 0.3573  
Epoch 38/100  
504/504 [=====] - 0s 124us/step - loss: 0.3525  
Epoch 39/100  
504/504 [=====] - 0s 155us/step - loss: 0.3482  
Epoch 40/100  
504/504 [=====] - 0s 124us/step - loss: 0.3435  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.3394  
Epoch 42/100  
504/504 [=====] - 0s 124us/step - loss: 0.3354  
Epoch 43/100  
504/504 [=====] - 0s 93us/step - loss: 0.3305  
Epoch 44/100  
504/504 [=====] - 0s 124us/step - loss: 0.3262  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.3221  
Epoch 46/100  
504/504 [=====] - 0s 124us/step - loss: 0.3184  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.3140  
Epoch 48/100  
504/504 [=====] - 0s 124us/step - loss: 0.3106  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.3067  
Epoch 50/100



504/504 [=====] - 0s 124us/step - loss: 0.3036  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2997  
Epoch 52/100  
504/504 [=====] - 0s 93us/step - loss: 0.2962  
Epoch 53/100  
504/504 [=====] - 0s 124us/step - loss: 0.2930  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2904  
Epoch 55/100  
504/504 [=====] - 0s 124us/step - loss: 0.2857  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2829  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2802  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2762  
Epoch 59/100  
504/504 [=====] - 0s 124us/step - loss: 0.2731  
Epoch 60/100  
504/504 [=====] - 0s 93us/step - loss: 0.2704  
Epoch 61/100  
504/504 [=====] - 0s 107us/step - loss: 0.2673  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2642  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2617  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2583  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2556  
Epoch 66/100  
504/504 [=====] - 0s 124us/step - loss: 0.2530  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2503  
Epoch 68/100  
504/504 [=====] - 0s 124us/step - loss: 0.2477  
Epoch 69/100  
504/504 [=====] - 0s 124us/step - loss: 0.2450  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2433  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2403  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.2369  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2343  
Epoch 74/100

504/504 [=====] - 0s 93us/step - loss: 0.2321  
Epoch 75/100  
504/504 [=====] - 0s 124us/step - loss: 0.2282  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.2252  
Epoch 77/100  
504/504 [=====] - 0s 124us/step - loss: 0.2223  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.2200  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.2171  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.2152  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.2129  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.2106  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.2086  
Epoch 84/100  
504/504 [=====] - 0s 124us/step - loss: 0.2066  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.2049  
Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.2029  
Epoch 87/100  
504/504 [=====] - 0s 124us/step - loss: 0.2013  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.1999  
Epoch 89/100  
504/504 [=====] - 0s 124us/step - loss: 0.1977  
Epoch 90/100  
504/504 [=====] - 0s 93us/step - loss: 0.1961  
Epoch 91/100  
504/504 [=====] - 0s 124us/step - loss: 0.1943  
Epoch 92/100  
504/504 [=====] - 0s 93us/step - loss: 0.1923  
Epoch 93/100  
504/504 [=====] - 0s 93us/step - loss: 0.1906  
Epoch 94/100  
504/504 [=====] - 0s 124us/step - loss: 0.1892  
Epoch 95/100  
504/504 [=====] - 0s 93us/step - loss: 0.1891  
Epoch 96/100  
504/504 [=====] - 0s 124us/step - loss: 0.1866  
Epoch 97/100  
504/504 [=====] - 0s 93us/step - loss: 0.1857  
Epoch 98/100

504/504 [=====] - 0s 93us/step - loss: 0.1850  
 Epoch 99/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1821  
 Epoch 100/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1805  
 Epoch 1/100  
 504/504 [=====] - 4s 9ms/step - loss: 1.1256  
 Epoch 2/100  
 504/504 [=====] - 0s 133us/step - loss: 1.0108  
 Epoch 3/100  
 504/504 [=====] - 0s 111us/step - loss: 0.9161  
 Epoch 4/100  
 504/504 [=====] - 0s 93us/step - loss: 0.8473  
 Epoch 5/100  
 504/504 [=====] - 0s 124us/step - loss: 0.7914  
 Epoch 6/100  
 504/504 [=====] - 0s 124us/step - loss: 0.7444  
 Epoch 7/100  
 504/504 [=====] - 0s 124us/step - loss: 0.7071  
 Epoch 8/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6742  
 Epoch 9/100  
 504/504 [=====] - 0s 155us/step - loss: 0.6459  
 Epoch 10/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6201  
 Epoch 11/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5980  
 Epoch 12/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5777  
 Epoch 13/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5604  
 Epoch 14/100  
 504/504 [=====] - 0s 155us/step - loss: 0.5443  
 Epoch 15/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5304  
 Epoch 16/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5176  
 Epoch 17/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5063  
 Epoch 18/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4955  
 Epoch 19/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4852  
 Epoch 20/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4766  
 Epoch 21/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4673  
 Epoch 22/100

504/504 [=====] - 0s 124us/step - loss: 0.4589  
 Epoch 23/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4508  
 Epoch 24/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4432  
 Epoch 25/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4353  
 Epoch 26/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4278  
 Epoch 27/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4208  
 Epoch 28/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4137  
 Epoch 29/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4070  
 Epoch 30/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4004  
 Epoch 31/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3940  
 Epoch 32/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3881  
 Epoch 33/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3823  
 Epoch 34/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3768  
 Epoch 35/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3706  
 Epoch 36/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3649  
 Epoch 37/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3595  
 Epoch 38/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3544  
 Epoch 39/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3478  
 Epoch 40/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3428  
 Epoch 41/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3369  
 Epoch 42/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3317  
 Epoch 43/100  
 504/504 [=====] - 0s 125us/step - loss: 0.3266  
 Epoch 44/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3212  
 Epoch 45/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3158  
 Epoch 46/100

504/504 [=====] - 0s 124us/step - loss: 0.3110  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.3063  
Epoch 48/100  
504/504 [=====] - 0s 124us/step - loss: 0.3020  
Epoch 49/100  
504/504 [=====] - 0s 124us/step - loss: 0.2975  
Epoch 50/100  
504/504 [=====] - 0s 155us/step - loss: 0.2941  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.2900  
Epoch 52/100  
504/504 [=====] - 0s 155us/step - loss: 0.2857  
Epoch 53/100  
504/504 [=====] - 0s 124us/step - loss: 0.2816  
Epoch 54/100  
504/504 [=====] - 0s 155us/step - loss: 0.2779  
Epoch 55/100  
504/504 [=====] - 0s 124us/step - loss: 0.2733  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2696  
Epoch 57/100  
504/504 [=====] - 0s 155us/step - loss: 0.2654  
Epoch 58/100  
504/504 [=====] - 0s 155us/step - loss: 0.2611  
Epoch 59/100  
504/504 [=====] - 0s 124us/step - loss: 0.2569  
Epoch 60/100  
504/504 [=====] - 0s 155us/step - loss: 0.2533  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.2495  
Epoch 62/100  
504/504 [=====] - 0s 124us/step - loss: 0.2453  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2414  
Epoch 64/100  
504/504 [=====] - 0s 124us/step - loss: 0.2374  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2339  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2300  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2273  
Epoch 68/100  
504/504 [=====] - 0s 155us/step - loss: 0.2231  
Epoch 69/100  
504/504 [=====] - 0s 124us/step - loss: 0.2202  
Epoch 70/100

504/504 [=====] - 0s 155us/step - loss: 0.2167  
Epoch 71/100  
504/504 [=====] - 0s 124us/step - loss: 0.2136  
Epoch 72/100  
504/504 [=====] - 0s 155us/step - loss: 0.2117  
Epoch 73/100  
504/504 [=====] - 0s 155us/step - loss: 0.2084  
Epoch 74/100  
504/504 [=====] - 0s 125us/step - loss: 0.2052  
Epoch 75/100  
504/504 [=====] - 0s 124us/step - loss: 0.2028  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.2002  
Epoch 77/100  
504/504 [=====] - 0s 124us/step - loss: 0.1979  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.1961  
Epoch 79/100  
504/504 [=====] - 0s 93us/step - loss: 0.1932  
Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.1906  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.1887  
Epoch 82/100  
504/504 [=====] - 0s 124us/step - loss: 0.1867  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.1848  
Epoch 84/100  
504/504 [=====] - 0s 124us/step - loss: 0.1825  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.1801  
Epoch 86/100  
504/504 [=====] - 0s 124us/step - loss: 0.1792  
Epoch 87/100  
504/504 [=====] - 0s 93us/step - loss: 0.1764  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.1752  
Epoch 89/100  
504/504 [=====] - 0s 124us/step - loss: 0.1731  
Epoch 90/100  
504/504 [=====] - 0s 93us/step - loss: 0.1720  
Epoch 91/100  
504/504 [=====] - 0s 93us/step - loss: 0.1703  
Epoch 92/100  
504/504 [=====] - 0s 124us/step - loss: 0.1688  
Epoch 93/100  
504/504 [=====] - 0s 217us/step - loss: 0.1679  
Epoch 94/100

504/504 [=====] - 0s 217us/step - loss: 0.1665  
 Epoch 95/100  
 504/504 [=====] - 0s 217us/step - loss: 0.1653  
 Epoch 96/100  
 504/504 [=====] - 0s 217us/step - loss: 0.1647  
 Epoch 97/100  
 504/504 [=====] - 0s 217us/step - loss: 0.1632  
 Epoch 98/100  
 504/504 [=====] - 0s 186us/step - loss: 0.1620  
 Epoch 99/100  
 504/504 [=====] - 0s 217us/step - loss: 0.1610  
 Epoch 100/100  
 504/504 [=====] - 0s 186us/step - loss: 0.1593  
 Epoch 1/100  
 504/504 [=====] - 4s 9ms/step - loss: 2.1031  
 Epoch 2/100  
 504/504 [=====] - 0s 126us/step - loss: 1.8322  
 Epoch 3/100  
 504/504 [=====] - 0s 124us/step - loss: 1.6052  
 Epoch 4/100  
 504/504 [=====] - 0s 124us/step - loss: 1.4392  
 Epoch 5/100  
 504/504 [=====] - 0s 132us/step - loss: 1.3053  
 Epoch 6/100  
 504/504 [=====] - 0s 124us/step - loss: 1.1939  
 Epoch 7/100  
 504/504 [=====] - 0s 124us/step - loss: 1.1042  
 Epoch 8/100  
 504/504 [=====] - 0s 124us/step - loss: 1.0284  
 Epoch 9/100  
 504/504 [=====] - 0s 93us/step - loss: 0.9625  
 Epoch 10/100  
 504/504 [=====] - 0s 155us/step - loss: 0.9069  
 Epoch 11/100  
 504/504 [=====] - 0s 124us/step - loss: 0.8560  
 Epoch 12/100  
 504/504 [=====] - 0s 155us/step - loss: 0.8133  
 Epoch 13/100  
 504/504 [=====] - 0s 124us/step - loss: 0.7731  
 Epoch 14/100  
 504/504 [=====] - 0s 155us/step - loss: 0.7400  
 Epoch 15/100  
 504/504 [=====] - 0s 124us/step - loss: 0.7069  
 Epoch 16/100  
 504/504 [=====] - 0s 124us/step - loss: 0.6781  
 Epoch 17/100  
 504/504 [=====] - 0s 124us/step - loss: 0.6486  
 Epoch 18/100

504/504 [=====] - 0s 155us/step - loss: 0.6228  
Epoch 19/100  
504/504 [=====] - 0s 155us/step - loss: 0.5993  
Epoch 20/100  
504/504 [=====] - 0s 155us/step - loss: 0.5770  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.5560  
Epoch 22/100  
504/504 [=====] - 0s 124us/step - loss: 0.5375  
Epoch 23/100  
504/504 [=====] - 0s 124us/step - loss: 0.5194  
Epoch 24/100  
504/504 [=====] - 0s 155us/step - loss: 0.5027  
Epoch 25/100  
504/504 [=====] - 0s 155us/step - loss: 0.4880  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.4737  
Epoch 27/100  
504/504 [=====] - 0s 155us/step - loss: 0.4606  
Epoch 28/100  
504/504 [=====] - 0s 124us/step - loss: 0.4486  
Epoch 29/100  
504/504 [=====] - 0s 155us/step - loss: 0.4373  
Epoch 30/100  
504/504 [=====] - 0s 124us/step - loss: 0.4265  
Epoch 31/100  
504/504 [=====] - 0s 124us/step - loss: 0.4174  
Epoch 32/100  
504/504 [=====] - 0s 124us/step - loss: 0.4079  
Epoch 33/100  
504/504 [=====] - 0s 155us/step - loss: 0.3993  
Epoch 34/100  
504/504 [=====] - 0s 155us/step - loss: 0.3911  
Epoch 35/100  
504/504 [=====] - 0s 155us/step - loss: 0.3836  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.3762  
Epoch 37/100  
504/504 [=====] - 0s 155us/step - loss: 0.3693  
Epoch 38/100  
504/504 [=====] - 0s 155us/step - loss: 0.3615  
Epoch 39/100  
504/504 [=====] - 0s 155us/step - loss: 0.3549  
Epoch 40/100  
504/504 [=====] - 0s 124us/step - loss: 0.3484  
Epoch 41/100  
504/504 [=====] - 0s 155us/step - loss: 0.3420  
Epoch 42/100



504/504 [=====] - 0s 186us/step - loss: 0.3361  
Epoch 43/100  
504/504 [=====] - 0s 186us/step - loss: 0.3302  
Epoch 44/100  
504/504 [=====] - 0s 124us/step - loss: 0.3251  
Epoch 45/100  
504/504 [=====] - 0s 155us/step - loss: 0.3188  
Epoch 46/100  
504/504 [=====] - 0s 155us/step - loss: 0.3133  
Epoch 47/100  
504/504 [=====] - 0s 155us/step - loss: 0.3086  
Epoch 48/100  
504/504 [=====] - 0s 155us/step - loss: 0.3036  
Epoch 49/100  
504/504 [=====] - 0s 155us/step - loss: 0.2984  
Epoch 50/100  
504/504 [=====] - 0s 124us/step - loss: 0.2940  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.2900  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.2853  
Epoch 53/100  
504/504 [=====] - 0s 124us/step - loss: 0.2819  
Epoch 54/100  
504/504 [=====] - 0s 155us/step - loss: 0.2774  
Epoch 55/100  
504/504 [=====] - 0s 155us/step - loss: 0.2738  
Epoch 56/100  
504/504 [=====] - 0s 124us/step - loss: 0.2702  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2664  
Epoch 58/100  
504/504 [=====] - 0s 124us/step - loss: 0.2628  
Epoch 59/100  
504/504 [=====] - 0s 155us/step - loss: 0.2593  
Epoch 60/100  
504/504 [=====] - 0s 155us/step - loss: 0.2562  
Epoch 61/100  
504/504 [=====] - 0s 155us/step - loss: 0.2535  
Epoch 62/100  
504/504 [=====] - 0s 155us/step - loss: 0.2503  
Epoch 63/100  
504/504 [=====] - 0s 155us/step - loss: 0.2468  
Epoch 64/100  
504/504 [=====] - 0s 124us/step - loss: 0.2436  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2405  
Epoch 66/100

504/504 [=====] - 0s 155us/step - loss: 0.2377  
Epoch 67/100  
504/504 [=====] - 0s 155us/step - loss: 0.2350  
Epoch 68/100  
504/504 [=====] - 0s 155us/step - loss: 0.2322  
Epoch 69/100  
504/504 [=====] - 0s 124us/step - loss: 0.2296  
Epoch 70/100  
504/504 [=====] - 0s 93us/step - loss: 0.2269  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2244  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.2224  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2196  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.2175  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.2152  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.2127  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.2107  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.2093  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.2069  
Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.2050  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.2030  
Epoch 82/100  
504/504 [=====] - 0s 124us/step - loss: 0.2009  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.1994  
Epoch 84/100  
504/504 [=====] - 0s 93us/step - loss: 0.1978  
Epoch 85/100  
504/504 [=====] - 0s 124us/step - loss: 0.1960  
Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.1949  
Epoch 87/100  
504/504 [=====] - 0s 124us/step - loss: 0.1930  
Epoch 88/100  
504/504 [=====] - 0s 93us/step - loss: 0.1915  
Epoch 89/100  
504/504 [=====] - 0s 124us/step - loss: 0.1901  
Epoch 90/100

504/504 [=====] - 0s 93us/step - loss: 0.1895  
 Epoch 91/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1875  
 Epoch 92/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1861  
 Epoch 93/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1851  
 Epoch 94/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1833  
 Epoch 95/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1820  
 Epoch 96/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1815  
 Epoch 97/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1798  
 Epoch 98/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1782  
 Epoch 99/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1778  
 Epoch 100/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1769  
 Epoch 1/100  
 504/504 [=====] - 4s 9ms/step - loss: 0.9373  
 Epoch 2/100  
 504/504 [=====] - 0s 135us/step - loss: 0.8312  
 Epoch 3/100  
 504/504 [=====] - 0s 124us/step - loss: 0.7528  
 Epoch 4/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6906  
 Epoch 5/100  
 504/504 [=====] - 0s 138us/step - loss: 0.6414  
 Epoch 6/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6019  
 Epoch 7/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5680  
 Epoch 8/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5386  
 Epoch 9/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5158  
 Epoch 10/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4945  
 Epoch 11/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4770  
 Epoch 12/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4616  
 Epoch 13/100  
 504/504 [=====] - 0s 155us/step - loss: 0.4481  
 Epoch 14/100

504/504 [=====] - 0s 93us/step - loss: 0.4356  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.4255  
Epoch 16/100  
504/504 [=====] - 0s 124us/step - loss: 0.4168  
Epoch 17/100  
504/504 [=====] - 0s 124us/step - loss: 0.4075  
Epoch 18/100  
504/504 [=====] - 0s 93us/step - loss: 0.3992  
Epoch 19/100  
504/504 [=====] - 0s 124us/step - loss: 0.3915  
Epoch 20/100  
504/504 [=====] - 0s 124us/step - loss: 0.3849  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.3775  
Epoch 22/100  
504/504 [=====] - 0s 124us/step - loss: 0.3717  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.3666  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.3604  
Epoch 25/100  
504/504 [=====] - 0s 124us/step - loss: 0.3551  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.3502  
Epoch 27/100  
504/504 [=====] - 0s 124us/step - loss: 0.3450  
Epoch 28/100  
504/504 [=====] - 0s 155us/step - loss: 0.3393  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3348  
Epoch 30/100  
504/504 [=====] - 0s 124us/step - loss: 0.3299  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3255  
Epoch 32/100  
504/504 [=====] - 0s 93us/step - loss: 0.3210  
Epoch 33/100  
504/504 [=====] - 0s 155us/step - loss: 0.3167  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.3119  
Epoch 35/100  
504/504 [=====] - 0s 155us/step - loss: 0.3076  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.3036  
Epoch 37/100  
504/504 [=====] - 0s 124us/step - loss: 0.2999  
Epoch 38/100

504/504 [=====] - 0s 124us/step - loss: 0.2962  
Epoch 39/100  
504/504 [=====] - 0s 124us/step - loss: 0.2925  
Epoch 40/100  
504/504 [=====] - 0s 124us/step - loss: 0.2887  
Epoch 41/100  
504/504 [=====] - 0s 124us/step - loss: 0.2862  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.2821  
Epoch 43/100  
504/504 [=====] - 0s 124us/step - loss: 0.2789  
Epoch 44/100  
504/504 [=====] - 0s 124us/step - loss: 0.2759  
Epoch 45/100  
504/504 [=====] - 0s 124us/step - loss: 0.2733  
Epoch 46/100  
504/504 [=====] - 0s 124us/step - loss: 0.2703  
Epoch 47/100  
504/504 [=====] - 0s 124us/step - loss: 0.2674  
Epoch 48/100  
504/504 [=====] - 0s 124us/step - loss: 0.2656  
Epoch 49/100  
504/504 [=====] - 0s 155us/step - loss: 0.2625  
Epoch 50/100  
504/504 [=====] - 0s 155us/step - loss: 0.2596  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.2574  
Epoch 52/100  
504/504 [=====] - 0s 155us/step - loss: 0.2548  
Epoch 53/100  
504/504 [=====] - 0s 124us/step - loss: 0.2526  
Epoch 54/100  
504/504 [=====] - 0s 124us/step - loss: 0.2498  
Epoch 55/100  
504/504 [=====] - 0s 124us/step - loss: 0.2475  
Epoch 56/100  
504/504 [=====] - 0s 124us/step - loss: 0.2456  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2436  
Epoch 58/100  
504/504 [=====] - 0s 124us/step - loss: 0.2407  
Epoch 59/100  
504/504 [=====] - 0s 155us/step - loss: 0.2380  
Epoch 60/100  
504/504 [=====] - 0s 124us/step - loss: 0.2359  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.2344  
Epoch 62/100

504/504 [=====] - 0s 93us/step - loss: 0.2315  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2293  
Epoch 64/100  
504/504 [=====] - 0s 155us/step - loss: 0.2273  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2248  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2232  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.2201  
Epoch 68/100  
504/504 [=====] - 0s 155us/step - loss: 0.2181  
Epoch 69/100  
504/504 [=====] - 0s 124us/step - loss: 0.2158  
Epoch 70/100  
504/504 [=====] - 0s 155us/step - loss: 0.2136  
Epoch 71/100  
504/504 [=====] - 0s 155us/step - loss: 0.2117  
Epoch 72/100  
504/504 [=====] - 0s 155us/step - loss: 0.2092  
Epoch 73/100  
504/504 [=====] - 0s 124us/step - loss: 0.2076  
Epoch 74/100  
504/504 [=====] - 0s 155us/step - loss: 0.2049  
Epoch 75/100  
504/504 [=====] - 0s 124us/step - loss: 0.2034  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.2010  
Epoch 77/100  
504/504 [=====] - 0s 96us/step - loss: 0.1992  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.1971  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.1957  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.1930  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.1927  
Epoch 82/100  
504/504 [=====] - 0s 124us/step - loss: 0.1908  
Epoch 83/100  
504/504 [=====] - 0s 155us/step - loss: 0.1883  
Epoch 84/100  
504/504 [=====] - 0s 124us/step - loss: 0.1866  
Epoch 85/100  
504/504 [=====] - 0s 124us/step - loss: 0.1854  
Epoch 86/100

504/504 [=====] - 0s 93us/step - loss: 0.1838  
 Epoch 87/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1827  
 Epoch 88/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1808  
 Epoch 89/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1795  
 Epoch 90/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1780  
 Epoch 91/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1769  
 Epoch 92/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1752  
 Epoch 93/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1743  
 Epoch 94/100  
 504/504 [=====] - 0s 93us/step - loss: 0.1734  
 Epoch 95/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1720  
 Epoch 96/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1708  
 Epoch 97/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1693  
 Epoch 98/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1679  
 Epoch 99/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1665  
 Epoch 100/100  
 504/504 [=====] - 0s 124us/step - loss: 0.1656  
 Epoch 1/100  
 504/504 [=====] - 5s 9ms/step - loss: 2.4128  
 Epoch 2/100  
 504/504 [=====] - 0s 155us/step - loss: 2.0082  
 Epoch 3/100  
 504/504 [=====] - 0s 124us/step - loss: 1.6871  
 Epoch 4/100  
 504/504 [=====] - 0s 124us/step - loss: 1.4446  
 Epoch 5/100  
 504/504 [=====] - 0s 124us/step - loss: 1.2525  
 Epoch 6/100  
 504/504 [=====] - 0s 93us/step - loss: 1.1063  
 Epoch 7/100  
 504/504 [=====] - 0s 124us/step - loss: 0.9912  
 Epoch 8/100  
 504/504 [=====] - 0s 93us/step - loss: 0.8986  
 Epoch 9/100  
 504/504 [=====] - 0s 124us/step - loss: 0.8271  
 Epoch 10/100

504/504 [=====] - 0s 93us/step - loss: 0.7628  
 Epoch 11/100  
 504/504 [=====] - 0s 124us/step - loss: 0.7103  
 Epoch 12/100  
 504/504 [=====] - 0s 124us/step - loss: 0.6664  
 Epoch 13/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6296  
 Epoch 14/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5970  
 Epoch 15/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5673  
 Epoch 16/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5421  
 Epoch 17/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5203  
 Epoch 18/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5008  
 Epoch 19/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4836  
 Epoch 20/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4687  
 Epoch 21/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4547  
 Epoch 22/100  
 504/504 [=====] - 0s 95us/step - loss: 0.4418  
 Epoch 23/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4308  
 Epoch 24/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4201  
 Epoch 25/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4097  
 Epoch 26/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4008  
 Epoch 27/100  
 504/504 [=====] - 0s 93us/step - loss: 0.3927  
 Epoch 28/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3847  
 Epoch 29/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3779  
 Epoch 30/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3711  
 Epoch 31/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3648  
 Epoch 32/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3595  
 Epoch 33/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3535  
 Epoch 34/100



504/504 [=====] - 0s 124us/step - loss: 0.3487  
Epoch 35/100  
504/504 [=====] - 0s 124us/step - loss: 0.3436  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.3392  
Epoch 37/100  
504/504 [=====] - 0s 124us/step - loss: 0.3343  
Epoch 38/100  
504/504 [=====] - 0s 124us/step - loss: 0.3299  
Epoch 39/100  
504/504 [=====] - 0s 93us/step - loss: 0.3259  
Epoch 40/100  
504/504 [=====] - 0s 124us/step - loss: 0.3215  
Epoch 41/100  
504/504 [=====] - 0s 124us/step - loss: 0.3174  
Epoch 42/100  
504/504 [=====] - 0s 124us/step - loss: 0.3137  
Epoch 43/100  
504/504 [=====] - 0s 124us/step - loss: 0.3099  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.3061  
Epoch 45/100  
504/504 [=====] - 0s 124us/step - loss: 0.3025  
Epoch 46/100  
504/504 [=====] - 0s 124us/step - loss: 0.2987  
Epoch 47/100  
504/504 [=====] - 0s 124us/step - loss: 0.2957  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.2919  
Epoch 49/100  
504/504 [=====] - 0s 124us/step - loss: 0.2884  
Epoch 50/100  
504/504 [=====] - 0s 124us/step - loss: 0.2845  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.2807  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.2774  
Epoch 53/100  
504/504 [=====] - 0s 155us/step - loss: 0.2737  
Epoch 54/100  
504/504 [=====] - 0s 155us/step - loss: 0.2702  
Epoch 55/100  
504/504 [=====] - 0s 124us/step - loss: 0.2669  
Epoch 56/100  
504/504 [=====] - 0s 124us/step - loss: 0.2635  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2602  
Epoch 58/100

504/504 [=====] - 0s 124us/step - loss: 0.2572  
Epoch 59/100  
504/504 [=====] - 0s 124us/step - loss: 0.2535  
Epoch 60/100  
504/504 [=====] - 0s 155us/step - loss: 0.2504  
Epoch 61/100  
504/504 [=====] - 0s 155us/step - loss: 0.2469  
Epoch 62/100  
504/504 [=====] - 0s 124us/step - loss: 0.2440  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2407  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2375  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2345  
Epoch 66/100  
504/504 [=====] - 0s 124us/step - loss: 0.2318  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.2286  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2261  
Epoch 69/100  
504/504 [=====] - 0s 124us/step - loss: 0.2233  
Epoch 70/100  
504/504 [=====] - 0s 124us/step - loss: 0.2206  
Epoch 71/100  
504/504 [=====] - 0s 124us/step - loss: 0.2182  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.2159  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.2132  
Epoch 74/100  
504/504 [=====] - 0s 124us/step - loss: 0.2113  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.2088  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.2066  
Epoch 77/100  
504/504 [=====] - 0s 186us/step - loss: 0.2044  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.2025  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.2006  
Epoch 80/100  
504/504 [=====] - 0s 93us/step - loss: 0.1990  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.1969  
Epoch 82/100

504/504 [=====] - 0s 124us/step - loss: 0.1953  
Epoch 83/100  
504/504 [=====] - 0s 93us/step - loss: 0.1939  
Epoch 84/100  
504/504 [=====] - 0s 124us/step - loss: 0.1922  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.1908  
Epoch 86/100  
504/504 [=====] - 0s 124us/step - loss: 0.1892  
Epoch 87/100  
504/504 [=====] - 0s 93us/step - loss: 0.1882  
Epoch 88/100  
504/504 [=====] - 0s 124us/step - loss: 0.1870  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.1856  
Epoch 90/100  
504/504 [=====] - 0s 93us/step - loss: 0.1844  
Epoch 91/100  
504/504 [=====] - 0s 124us/step - loss: 0.1832  
Epoch 92/100  
504/504 [=====] - 0s 93us/step - loss: 0.1824  
Epoch 93/100  
504/504 [=====] - 0s 124us/step - loss: 0.1815  
Epoch 94/100  
504/504 [=====] - 0s 93us/step - loss: 0.1803  
Epoch 95/100  
504/504 [=====] - 0s 93us/step - loss: 0.1796  
Epoch 96/100  
504/504 [=====] - 0s 124us/step - loss: 0.1787  
Epoch 97/100  
504/504 [=====] - 0s 124us/step - loss: 0.1783  
Epoch 98/100  
504/504 [=====] - 0s 124us/step - loss: 0.1769  
Epoch 99/100  
504/504 [=====] - 0s 93us/step - loss: 0.1764  
Epoch 100/100  
504/504 [=====] - 0s 124us/step - loss: 0.1753  
Epoch 1/100  
504/504 [=====] - 5s 10ms/step - loss: 1.6832  
Epoch 2/100  
504/504 [=====] - 0s 93us/step - loss: 1.4820  
Epoch 3/100  
504/504 [=====] - 0s 109us/step - loss: 1.3126  
Epoch 4/100  
504/504 [=====] - 0s 93us/step - loss: 1.1738  
Epoch 5/100  
504/504 [=====] - 0s 124us/step - loss: 1.0642  
Epoch 6/100

504/504 [=====] - 0s 124us/step - loss: 0.9724  
Epoch 7/100  
504/504 [=====] - 0s 93us/step - loss: 0.8965  
Epoch 8/100  
504/504 [=====] - 0s 155us/step - loss: 0.8309  
Epoch 9/100  
504/504 [=====] - 0s 155us/step - loss: 0.7766  
Epoch 10/100  
504/504 [=====] - 0s 155us/step - loss: 0.7293  
Epoch 11/100  
504/504 [=====] - 0s 155us/step - loss: 0.6886  
Epoch 12/100  
504/504 [=====] - 0s 124us/step - loss: 0.6547  
Epoch 13/100  
504/504 [=====] - 0s 124us/step - loss: 0.6237  
Epoch 14/100  
504/504 [=====] - 0s 155us/step - loss: 0.5969  
Epoch 15/100  
504/504 [=====] - 0s 186us/step - loss: 0.5732  
Epoch 16/100  
504/504 [=====] - 0s 155us/step - loss: 0.5510  
Epoch 17/100  
504/504 [=====] - 0s 155us/step - loss: 0.5310  
Epoch 18/100  
504/504 [=====] - 0s 155us/step - loss: 0.5125  
Epoch 19/100  
504/504 [=====] - 0s 155us/step - loss: 0.4969  
Epoch 20/100  
504/504 [=====] - 0s 155us/step - loss: 0.4833  
Epoch 21/100  
504/504 [=====] - 0s 155us/step - loss: 0.4690  
Epoch 22/100  
504/504 [=====] - 0s 155us/step - loss: 0.4582  
Epoch 23/100  
504/504 [=====] - 0s 155us/step - loss: 0.4469  
Epoch 24/100  
504/504 [=====] - 0s 155us/step - loss: 0.4369  
Epoch 25/100  
504/504 [=====] - 0s 155us/step - loss: 0.4284  
Epoch 26/100  
504/504 [=====] - 0s 155us/step - loss: 0.4204  
Epoch 27/100  
504/504 [=====] - 0s 186us/step - loss: 0.4134  
Epoch 28/100  
504/504 [=====] - 0s 155us/step - loss: 0.4068  
Epoch 29/100  
504/504 [=====] - 0s 155us/step - loss: 0.4004  
Epoch 30/100

504/504 [=====] - 0s 155us/step - loss: 0.3938  
Epoch 31/100  
504/504 [=====] - 0s 155us/step - loss: 0.3884  
Epoch 32/100  
504/504 [=====] - 0s 155us/step - loss: 0.3821  
Epoch 33/100  
504/504 [=====] - 0s 124us/step - loss: 0.3768  
Epoch 34/100  
504/504 [=====] - 0s 155us/step - loss: 0.3717  
Epoch 35/100  
504/504 [=====] - 0s 155us/step - loss: 0.3660  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.3610  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3568  
Epoch 38/100  
504/504 [=====] - 0s 124us/step - loss: 0.3524  
Epoch 39/100  
504/504 [=====] - 0s 124us/step - loss: 0.3480  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.3440  
Epoch 41/100  
504/504 [=====] - 0s 124us/step - loss: 0.3398  
Epoch 42/100  
504/504 [=====] - 0s 124us/step - loss: 0.3365  
Epoch 43/100  
504/504 [=====] - 0s 156us/step - loss: 0.3325  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.3292  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.3258  
Epoch 46/100  
504/504 [=====] - 0s 124us/step - loss: 0.3224  
Epoch 47/100  
504/504 [=====] - 0s 124us/step - loss: 0.3192  
Epoch 48/100  
504/504 [=====] - 0s 93us/step - loss: 0.3153  
Epoch 49/100  
504/504 [=====] - 0s 124us/step - loss: 0.3125  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.3092  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.3064  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.3036  
Epoch 53/100  
504/504 [=====] - 0s 155us/step - loss: 0.3004  
Epoch 54/100

504/504 [=====] - 0s 155us/step - loss: 0.2975  
Epoch 55/100  
504/504 [=====] - 0s 186us/step - loss: 0.2952  
Epoch 56/100  
504/504 [=====] - 0s 155us/step - loss: 0.2924  
Epoch 57/100  
504/504 [=====] - 0s 155us/step - loss: 0.2894  
Epoch 58/100  
504/504 [=====] - 0s 124us/step - loss: 0.2869  
Epoch 59/100  
504/504 [=====] - 0s 155us/step - loss: 0.2845  
Epoch 60/100  
504/504 [=====] - 0s 124us/step - loss: 0.2816  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.2792  
Epoch 62/100  
504/504 [=====] - 0s 124us/step - loss: 0.2774  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2742  
Epoch 64/100  
504/504 [=====] - 0s 124us/step - loss: 0.2720  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2706  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2673  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.2651  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2628  
Epoch 69/100  
504/504 [=====] - 0s 124us/step - loss: 0.2615  
Epoch 70/100  
504/504 [=====] - 0s 124us/step - loss: 0.2583  
Epoch 71/100  
504/504 [=====] - 0s 124us/step - loss: 0.2560  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.2539  
Epoch 73/100  
504/504 [=====] - 0s 124us/step - loss: 0.2518  
Epoch 74/100  
504/504 [=====] - 0s 124us/step - loss: 0.2497  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.2479  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.2457  
Epoch 77/100  
504/504 [=====] - 0s 124us/step - loss: 0.2444  
Epoch 78/100

504/504 [=====] - 0s 124us/step - loss: 0.2421  
 Epoch 79/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2404  
 Epoch 80/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2385  
 Epoch 81/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2364  
 Epoch 82/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2346  
 Epoch 83/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2328  
 Epoch 84/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2307  
 Epoch 85/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2293  
 Epoch 86/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2276  
 Epoch 87/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2260  
 Epoch 88/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2243  
 Epoch 89/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2234  
 Epoch 90/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2217  
 Epoch 91/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2202  
 Epoch 92/100  
 504/504 [=====] - 0s 97us/step - loss: 0.2185  
 Epoch 93/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2181  
 Epoch 94/100  
 504/504 [=====] - 0s 106us/step - loss: 0.2164  
 Epoch 95/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2148  
 Epoch 96/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2137  
 Epoch 97/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2126  
 Epoch 98/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2120  
 Epoch 99/100  
 504/504 [=====] - 0s 94us/step - loss: 0.2100  
 Epoch 100/100  
 504/504 [=====] - 0s 155us/step - loss: 0.2090  
 Epoch 1/100  
 504/504 [=====] - 5s 10ms/step - loss: 1.7008  
 Epoch 2/100

504/504 [=====] - 0s 93us/step - loss: 1.4992  
 Epoch 3/100  
 504/504 [=====] - 0s 124us/step - loss: 1.3298  
 Epoch 4/100  
 504/504 [=====] - 0s 124us/step - loss: 1.1852  
 Epoch 5/100  
 504/504 [=====] - 0s 93us/step - loss: 1.0626  
 Epoch 6/100  
 504/504 [=====] - 0s 124us/step - loss: 0.9652  
 Epoch 7/100  
 504/504 [=====] - 0s 93us/step - loss: 0.8798  
 Epoch 8/100  
 504/504 [=====] - 0s 124us/step - loss: 0.8073  
 Epoch 9/100  
 504/504 [=====] - 0s 124us/step - loss: 0.7476  
 Epoch 10/100  
 504/504 [=====] - 0s 124us/step - loss: 0.6950  
 Epoch 11/100  
 504/504 [=====] - 0s 93us/step - loss: 0.6510  
 Epoch 12/100  
 504/504 [=====] - 0s 124us/step - loss: 0.6130  
 Epoch 13/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5834  
 Epoch 14/100  
 504/504 [=====] - 0s 93us/step - loss: 0.5545  
 Epoch 15/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5306  
 Epoch 16/100  
 504/504 [=====] - 0s 124us/step - loss: 0.5102  
 Epoch 17/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4917  
 Epoch 18/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4751  
 Epoch 19/100  
 504/504 [=====] - 0s 93us/step - loss: 0.4607  
 Epoch 20/100  
 504/504 [=====] - 0s 124us/step - loss: 0.4478  
 Epoch 21/100  
 504/504 [=====] - 0s 155us/step - loss: 0.4357  
 Epoch 22/100  
 504/504 [=====] - 0s 155us/step - loss: 0.4242  
 Epoch 23/100  
 504/504 [=====] - 0s 155us/step - loss: 0.4138  
 Epoch 24/100  
 504/504 [=====] - 0s 155us/step - loss: 0.4046  
 Epoch 25/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3956  
 Epoch 26/100



504/504 [=====] - 0s 124us/step - loss: 0.3873  
 Epoch 27/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3789  
 Epoch 28/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3713  
 Epoch 29/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3637  
 Epoch 30/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3559  
 Epoch 31/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3489  
 Epoch 32/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3419  
 Epoch 33/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3350  
 Epoch 34/100  
 504/504 [=====] - 0s 124us/step - loss: 0.3288  
 Epoch 35/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3225  
 Epoch 36/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3164  
 Epoch 37/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3107  
 Epoch 38/100  
 504/504 [=====] - 0s 155us/step - loss: 0.3057  
 Epoch 39/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2994  
 Epoch 40/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2945  
 Epoch 41/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2890  
 Epoch 42/100  
 504/504 [=====] - 0s 155us/step - loss: 0.2845  
 Epoch 43/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2799  
 Epoch 44/100  
 504/504 [=====] - 0s 155us/step - loss: 0.2756  
 Epoch 45/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2713  
 Epoch 46/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2676  
 Epoch 47/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2638  
 Epoch 48/100  
 504/504 [=====] - 0s 124us/step - loss: 0.2599  
 Epoch 49/100  
 504/504 [=====] - 0s 93us/step - loss: 0.2561  
 Epoch 50/100

504/504 [=====] - 0s 124us/step - loss: 0.2526  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.2498  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.2461  
Epoch 53/100  
504/504 [=====] - 0s 124us/step - loss: 0.2428  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2396  
Epoch 55/100  
504/504 [=====] - 0s 124us/step - loss: 0.2367  
Epoch 56/100  
504/504 [=====] - 0s 124us/step - loss: 0.2338  
Epoch 57/100  
504/504 [=====] - 0s 93us/step - loss: 0.2311  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2278  
Epoch 59/100  
504/504 [=====] - 0s 124us/step - loss: 0.2251  
Epoch 60/100  
504/504 [=====] - 0s 124us/step - loss: 0.2222  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.2201  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2177  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2153  
Epoch 64/100  
504/504 [=====] - 0s 93us/step - loss: 0.2127  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2107  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.2079  
Epoch 67/100  
504/504 [=====] - 0s 93us/step - loss: 0.2058  
Epoch 68/100  
504/504 [=====] - 0s 124us/step - loss: 0.2035  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2013  
Epoch 70/100  
504/504 [=====] - 0s 124us/step - loss: 0.1990  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.1968  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.1948  
Epoch 73/100  
504/504 [=====] - 0s 124us/step - loss: 0.1931  
Epoch 74/100

504/504 [=====] - 0s 115us/step - loss: 0.1914  
Epoch 75/100  
504/504 [=====] - 0s 124us/step - loss: 0.1892  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.1878  
Epoch 77/100  
504/504 [=====] - ETA: 0s - loss: 0.207 - 0s 93us/step  
- loss: 0.1860  
Epoch 78/100  
504/504 [=====] - 0s 93us/step - loss: 0.1842  
Epoch 79/100  
504/504 [=====] - 0s 128us/step - loss: 0.1831  
Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.1814  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.1799  
Epoch 82/100  
504/504 [=====] - 0s 124us/step - loss: 0.1786  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.1770  
Epoch 84/100  
504/504 [=====] - 0s 124us/step - loss: 0.1764  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.1753  
Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.1735  
Epoch 87/100  
504/504 [=====] - 0s 124us/step - loss: 0.1722  
Epoch 88/100  
504/504 [=====] - 0s 124us/step - loss: 0.1713  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.1702  
Epoch 90/100  
504/504 [=====] - 0s 93us/step - loss: 0.1693  
Epoch 91/100  
504/504 [=====] - 0s 124us/step - loss: 0.1679  
Epoch 92/100  
504/504 [=====] - 0s 93us/step - loss: 0.1671  
Epoch 93/100  
504/504 [=====] - 0s 124us/step - loss: 0.1653  
Epoch 94/100  
504/504 [=====] - 0s 124us/step - loss: 0.1643  
Epoch 95/100  
504/504 [=====] - 0s 124us/step - loss: 0.1630  
Epoch 96/100  
504/504 [=====] - 0s 131us/step - loss: 0.1624  
Epoch 97/100  
504/504 [=====] - 0s 124us/step - loss: 0.1613

Epoch 98/100  
504/504 [=====] - 0s 124us/step - loss: 0.1600  
Epoch 99/100  
504/504 [=====] - 0s 124us/step - loss: 0.1591  
Epoch 100/100  
504/504 [=====] - 0s 186us/step - loss: 0.1584  
Epoch 1/100  
504/504 [=====] - 5s 10ms/step - loss: 1.7018  
Epoch 2/100  
504/504 [=====] - 0s 186us/step - loss: 1.4699  
Epoch 3/100  
504/504 [=====] - 0s 186us/step - loss: 1.2771  
Epoch 4/100  
504/504 [=====] - 0s 217us/step - loss: 1.1204  
Epoch 5/100  
504/504 [=====] - 0s 186us/step - loss: 0.9849  
Epoch 6/100  
504/504 [=====] - 0s 124us/step - loss: 0.8791  
Epoch 7/100  
504/504 [=====] - 0s 124us/step - loss: 0.7924  
Epoch 8/100  
504/504 [=====] - 0s 155us/step - loss: 0.7174  
Epoch 9/100  
504/504 [=====] - 0s 155us/step - loss: 0.6574  
Epoch 10/100  
504/504 [=====] - 0s 155us/step - loss: 0.6103  
Epoch 11/100  
504/504 [=====] - 0s 186us/step - loss: 0.5700  
Epoch 12/100  
504/504 [=====] - 0s 155us/step - loss: 0.5386  
Epoch 13/100  
504/504 [=====] - 0s 156us/step - loss: 0.5132  
Epoch 14/100  
504/504 [=====] - 0s 186us/step - loss: 0.4935  
Epoch 15/100  
504/504 [=====] - 0s 124us/step - loss: 0.4766  
Epoch 16/100  
504/504 [=====] - 0s 124us/step - loss: 0.4608  
Epoch 17/100  
504/504 [=====] - 0s 155us/step - loss: 0.4487  
Epoch 18/100  
504/504 [=====] - 0s 186us/step - loss: 0.4359  
Epoch 19/100  
504/504 [=====] - 0s 186us/step - loss: 0.4243  
Epoch 20/100  
504/504 [=====] - 0s 155us/step - loss: 0.4142  
Epoch 21/100  
504/504 [=====] - 0s 155us/step - loss: 0.4035

Epoch 22/100  
504/504 [=====] - 0s 186us/step - loss: 0.3937  
Epoch 23/100  
504/504 [=====] - 0s 155us/step - loss: 0.3844  
Epoch 24/100  
504/504 [=====] - 0s 155us/step - loss: 0.3747  
Epoch 25/100  
504/504 [=====] - 0s 124us/step - loss: 0.3661  
Epoch 26/100  
504/504 [=====] - 0s 155us/step - loss: 0.3581  
Epoch 27/100  
504/504 [=====] - 0s 155us/step - loss: 0.3490  
Epoch 28/100  
504/504 [=====] - 0s 155us/step - loss: 0.3409  
Epoch 29/100  
504/504 [=====] - 0s 124us/step - loss: 0.3331  
Epoch 30/100  
504/504 [=====] - 0s 155us/step - loss: 0.3258  
Epoch 31/100  
504/504 [=====] - 0s 155us/step - loss: 0.3187  
Epoch 32/100  
504/504 [=====] - 0s 124us/step - loss: 0.3121  
Epoch 33/100  
504/504 [=====] - 0s 124us/step - loss: 0.3063  
Epoch 34/100  
504/504 [=====] - 0s 155us/step - loss: 0.3000  
Epoch 35/100  
504/504 [=====] - 0s 155us/step - loss: 0.2941  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.2882  
Epoch 37/100  
504/504 [=====] - 0s 186us/step - loss: 0.2822  
Epoch 38/100  
504/504 [=====] - 0s 156us/step - loss: 0.2763  
Epoch 39/100  
504/504 [=====] - 0s 124us/step - loss: 0.2704  
Epoch 40/100  
504/504 [=====] - 0s 155us/step - loss: 0.2642  
Epoch 41/100  
504/504 [=====] - 0s 186us/step - loss: 0.2589  
Epoch 42/100  
504/504 [=====] - 0s 186us/step - loss: 0.2535  
Epoch 43/100  
504/504 [=====] - 0s 186us/step - loss: 0.2481  
Epoch 44/100  
504/504 [=====] - 0s 186us/step - loss: 0.2433  
Epoch 45/100  
504/504 [=====] - 0s 124us/step - loss: 0.2384

Epoch 46/100  
504/504 [=====] - 0s 124us/step - loss: 0.2341  
Epoch 47/100  
504/504 [=====] - 0s 124us/step - loss: 0.2301  
Epoch 48/100  
504/504 [=====] - 0s 124us/step - loss: 0.2267  
Epoch 49/100  
504/504 [=====] - 0s 124us/step - loss: 0.2230  
Epoch 50/100  
504/504 [=====] - 0s 124us/step - loss: 0.2198  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.2172  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.2148  
Epoch 53/100  
504/504 [=====] - 0s 124us/step - loss: 0.2117  
Epoch 54/100  
504/504 [=====] - 0s 93us/step - loss: 0.2086  
Epoch 55/100  
504/504 [=====] - 0s 93us/step - loss: 0.2066  
Epoch 56/100  
504/504 [=====] - 0s 124us/step - loss: 0.2039  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2018  
Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.1999  
Epoch 59/100  
504/504 [=====] - 0s 124us/step - loss: 0.1978  
Epoch 60/100  
504/504 [=====] - 0s 124us/step - loss: 0.1961  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.1939  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.1922  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.1901  
Epoch 64/100  
504/504 [=====] - 0s 124us/step - loss: 0.1886  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.1866  
Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.1851  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.1837  
Epoch 68/100  
504/504 [=====] - 0s 124us/step - loss: 0.1821  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.1807

Epoch 70/100  
504/504 [=====] - 0s 124us/step - loss: 0.1793  
Epoch 71/100  
504/504 [=====] - 0s 124us/step - loss: 0.1777  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.1768  
Epoch 73/100  
504/504 [=====] - 0s 124us/step - loss: 0.1756  
Epoch 74/100  
504/504 [=====] - 0s 124us/step - loss: 0.1744  
Epoch 75/100  
504/504 [=====] - 0s 124us/step - loss: 0.1733  
Epoch 76/100  
504/504 [=====] - 0s 93us/step - loss: 0.1722  
Epoch 77/100  
504/504 [=====] - 0s 124us/step - loss: 0.1708  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.1697  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.1688  
Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.1681  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.1667  
Epoch 82/100  
504/504 [=====] - 0s 93us/step - loss: 0.1658  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.1653  
Epoch 84/100  
504/504 [=====] - 0s 124us/step - loss: 0.1639  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.1629  
Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.1626  
Epoch 87/100  
504/504 [=====] - 0s 124us/step - loss: 0.1615  
Epoch 88/100  
504/504 [=====] - 0s 124us/step - loss: 0.1609  
Epoch 89/100  
504/504 [=====] - 0s 93us/step - loss: 0.1596  
Epoch 90/100  
504/504 [=====] - 0s 93us/step - loss: 0.1591  
Epoch 91/100  
504/504 [=====] - 0s 124us/step - loss: 0.1585  
Epoch 92/100  
504/504 [=====] - 0s 124us/step - loss: 0.1574  
Epoch 93/100  
504/504 [=====] - 0s 124us/step - loss: 0.1565

Epoch 94/100  
504/504 [=====] - 0s 93us/step - loss: 0.1559  
Epoch 95/100  
504/504 [=====] - 0s 124us/step - loss: 0.1551  
Epoch 96/100  
504/504 [=====] - 0s 124us/step - loss: 0.1544  
Epoch 97/100  
504/504 [=====] - 0s 124us/step - loss: 0.1543  
Epoch 98/100  
504/504 [=====] - 0s 93us/step - loss: 0.1534  
Epoch 99/100  
504/504 [=====] - 0s 93us/step - loss: 0.1526  
Epoch 100/100  
504/504 [=====] - 0s 124us/step - loss: 0.1515  
Epoch 1/100  
504/504 [=====] - 4s 9ms/step - loss: 1.7492  
Epoch 2/100  
504/504 [=====] - 0s 124us/step - loss: 1.4632  
Epoch 3/100  
504/504 [=====] - 0s 124us/step - loss: 1.2455  
Epoch 4/100  
504/504 [=====] - 0s 124us/step - loss: 1.0821  
Epoch 5/100  
504/504 [=====] - 0s 124us/step - loss: 0.9557  
Epoch 6/100  
504/504 [=====] - 0s 93us/step - loss: 0.8585  
Epoch 7/100  
504/504 [=====] - 0s 124us/step - loss: 0.7770  
Epoch 8/100  
504/504 [=====] - 0s 93us/step - loss: 0.7161  
Epoch 9/100  
504/504 [=====] - 0s 124us/step - loss: 0.6656  
Epoch 10/100  
504/504 [=====] - 0s 124us/step - loss: 0.6288  
Epoch 11/100  
504/504 [=====] - 0s 93us/step - loss: 0.5931  
Epoch 12/100  
504/504 [=====] - 0s 124us/step - loss: 0.5686  
Epoch 13/100  
504/504 [=====] - 0s 124us/step - loss: 0.5485  
Epoch 14/100  
504/504 [=====] - 0s 124us/step - loss: 0.5299  
Epoch 15/100  
504/504 [=====] - 0s 124us/step - loss: 0.5164  
Epoch 16/100  
504/504 [=====] - 0s 124us/step - loss: 0.5032  
Epoch 17/100  
504/504 [=====] - 0s 124us/step - loss: 0.4931



Epoch 18/100  
504/504 [=====] - 0s 124us/step - loss: 0.4838  
Epoch 19/100  
504/504 [=====] - 0s 124us/step - loss: 0.4761  
Epoch 20/100  
504/504 [=====] - 0s 124us/step - loss: 0.4686  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.4619  
Epoch 22/100  
504/504 [=====] - 0s 93us/step - loss: 0.4558  
Epoch 23/100  
504/504 [=====] - 0s 124us/step - loss: 0.4494  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.4444  
Epoch 25/100  
504/504 [=====] - 0s 124us/step - loss: 0.4383  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.4337  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.4291  
Epoch 28/100  
504/504 [=====] - 0s 124us/step - loss: 0.4238  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.4203  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.4155  
Epoch 31/100  
504/504 [=====] - 0s 124us/step - loss: 0.4117  
Epoch 32/100  
504/504 [=====] - 0s 124us/step - loss: 0.4077  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.4033  
Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.3996  
Epoch 35/100  
504/504 [=====] - 0s 124us/step - loss: 0.3957  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.3921  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3886  
Epoch 38/100  
504/504 [=====] - 0s 124us/step - loss: 0.3851  
Epoch 39/100  
504/504 [=====] - 0s 124us/step - loss: 0.3823  
Epoch 40/100  
504/504 [=====] - 0s 93us/step - loss: 0.3796  
Epoch 41/100  
504/504 [=====] - 0s 124us/step - loss: 0.3768

Epoch 42/100  
504/504 [=====] - 0s 124us/step - loss: 0.3732  
Epoch 43/100  
504/504 [=====] - 0s 124us/step - loss: 0.3703  
Epoch 44/100  
504/504 [=====] - 0s 93us/step - loss: 0.3677  
Epoch 45/100  
504/504 [=====] - 0s 124us/step - loss: 0.3650  
Epoch 46/100  
504/504 [=====] - 0s 124us/step - loss: 0.3634  
Epoch 47/100  
504/504 [=====] - 0s 93us/step - loss: 0.3604  
Epoch 48/100  
504/504 [=====] - 0s 124us/step - loss: 0.3582  
Epoch 49/100  
504/504 [=====] - 0s 124us/step - loss: 0.3560  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.3545  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.3517  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.3492  
Epoch 53/100  
504/504 [=====] - 0s 93us/step - loss: 0.3472  
Epoch 54/100  
504/504 [=====] - 0s 124us/step - loss: 0.3467  
Epoch 55/100  
504/504 [=====] - 0s 124us/step - loss: 0.3436  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.3415  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.3403  
Epoch 58/100  
504/504 [=====] - 0s 124us/step - loss: 0.3381  
Epoch 59/100  
504/504 [=====] - 0s 93us/step - loss: 0.3365  
Epoch 60/100  
504/504 [=====] - 0s 124us/step - loss: 0.3353  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.3324  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.3309  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.3295  
Epoch 64/100  
504/504 [=====] - 0s 124us/step - loss: 0.3277  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.3249

Epoch 66/100  
504/504 [=====] - 0s 93us/step - loss: 0.3222  
Epoch 67/100  
504/504 [=====] - 0s 155us/step - loss: 0.3203  
Epoch 68/100  
504/504 [=====] - 0s 124us/step - loss: 0.3172  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.3153  
Epoch 70/100  
504/504 [=====] - 0s 124us/step - loss: 0.3129  
Epoch 71/100  
504/504 [=====] - 0s 124us/step - loss: 0.3119  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.3086  
Epoch 73/100  
504/504 [=====] - 0s 124us/step - loss: 0.3057  
Epoch 74/100  
504/504 [=====] - 0s 93us/step - loss: 0.3037  
Epoch 75/100  
504/504 [=====] - 0s 93us/step - loss: 0.3016  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.2989  
Epoch 77/100  
504/504 [=====] - 0s 124us/step - loss: 0.2964  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.2944  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.2924  
Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.2898  
Epoch 81/100  
504/504 [=====] - 0s 93us/step - loss: 0.2878  
Epoch 82/100  
504/504 [=====] - 0s 124us/step - loss: 0.2856  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.2841  
Epoch 84/100  
504/504 [=====] - 0s 124us/step - loss: 0.2818  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.2799  
Epoch 86/100  
504/504 [=====] - 0s 124us/step - loss: 0.2779  
Epoch 87/100  
504/504 [=====] - 0s 93us/step - loss: 0.2761  
Epoch 88/100  
504/504 [=====] - 0s 124us/step - loss: 0.2742  
Epoch 89/100  
504/504 [=====] - 0s 124us/step - loss: 0.2729

Epoch 90/100  
504/504 [=====] - 0s 93us/step - loss: 0.2702  
Epoch 91/100  
504/504 [=====] - 0s 124us/step - loss: 0.2692  
Epoch 92/100  
504/504 [=====] - 0s 124us/step - loss: 0.2670  
Epoch 93/100  
504/504 [=====] - 0s 93us/step - loss: 0.2647  
Epoch 94/100  
504/504 [=====] - 0s 124us/step - loss: 0.2629  
Epoch 95/100  
504/504 [=====] - 0s 124us/step - loss: 0.2620  
Epoch 96/100  
504/504 [=====] - 0s 124us/step - loss: 0.2603  
Epoch 97/100  
504/504 [=====] - 0s 124us/step - loss: 0.2589  
Epoch 98/100  
504/504 [=====] - 0s 124us/step - loss: 0.2573  
Epoch 99/100  
504/504 [=====] - 0s 124us/step - loss: 0.2560  
Epoch 100/100  
504/504 [=====] - 0s 93us/step - loss: 0.2553  
Epoch 1/100  
504/504 [=====] - 4s 9ms/step - loss: 1.6732  
Epoch 2/100  
504/504 [=====] - 0s 124us/step - loss: 1.4381  
Epoch 3/100  
504/504 [=====] - 0s 93us/step - loss: 1.2629  
Epoch 4/100  
504/504 [=====] - 0s 93us/step - loss: 1.1107  
Epoch 5/100  
504/504 [=====] - 0s 130us/step - loss: 0.9976  
Epoch 6/100  
504/504 [=====] - 0s 93us/step - loss: 0.9033  
Epoch 7/100  
504/504 [=====] - 0s 124us/step - loss: 0.8259  
Epoch 8/100  
504/504 [=====] - 0s 124us/step - loss: 0.7600  
Epoch 9/100  
504/504 [=====] - 0s 127us/step - loss: 0.7051  
Epoch 10/100  
504/504 [=====] - 0s 137us/step - loss: 0.6607  
Epoch 11/100  
504/504 [=====] - 0s 124us/step - loss: 0.6209  
Epoch 12/100  
504/504 [=====] - 0s 124us/step - loss: 0.5893  
Epoch 13/100  
504/504 [=====] - 0s 93us/step - loss: 0.5609

Epoch 14/100  
504/504 [=====] - 0s 130us/step - loss: 0.5391  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.5178  
Epoch 16/100  
504/504 [=====] - 0s 124us/step - loss: 0.5014  
Epoch 17/100  
504/504 [=====] - 0s 124us/step - loss: 0.4854  
Epoch 18/100  
504/504 [=====] - 0s 124us/step - loss: 0.4727  
Epoch 19/100  
504/504 [=====] - 0s 124us/step - loss: 0.4607  
Epoch 20/100  
504/504 [=====] - 0s 124us/step - loss: 0.4491  
Epoch 21/100  
504/504 [=====] - 0s 93us/step - loss: 0.4389  
Epoch 22/100  
504/504 [=====] - 0s 124us/step - loss: 0.4303  
Epoch 23/100  
504/504 [=====] - 0s 93us/step - loss: 0.4215  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.4141  
Epoch 25/100  
504/504 [=====] - 0s 124us/step - loss: 0.4067  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.3997  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.3936  
Epoch 28/100  
504/504 [=====] - 0s 93us/step - loss: 0.3872  
Epoch 29/100  
504/504 [=====] - 0s 93us/step - loss: 0.3814  
Epoch 30/100  
504/504 [=====] - 0s 124us/step - loss: 0.3757  
Epoch 31/100  
504/504 [=====] - 0s 124us/step - loss: 0.3697  
Epoch 32/100  
504/504 [=====] - 0s 124us/step - loss: 0.3640  
Epoch 33/100  
504/504 [=====] - 0s 124us/step - loss: 0.3587  
Epoch 34/100  
504/504 [=====] - 0s 124us/step - loss: 0.3533  
Epoch 35/100  
504/504 [=====] - 0s 124us/step - loss: 0.3479  
Epoch 36/100  
504/504 [=====] - 0s 93us/step - loss: 0.3431  
Epoch 37/100  
504/504 [=====] - 0s 124us/step - loss: 0.3381

Epoch 38/100  
504/504 [=====] - 0s 124us/step - loss: 0.3330  
Epoch 39/100  
504/504 [=====] - 0s 134us/step - loss: 0.3284  
Epoch 40/100  
504/504 [=====] - 0s 124us/step - loss: 0.3240  
Epoch 41/100  
504/504 [=====] - 0s 93us/step - loss: 0.3199  
Epoch 42/100  
504/504 [=====] - 0s 93us/step - loss: 0.3158  
Epoch 43/100  
504/504 [=====] - 0s 124us/step - loss: 0.3117  
Epoch 44/100  
504/504 [=====] - 0s 124us/step - loss: 0.3076  
Epoch 45/100  
504/504 [=====] - 0s 93us/step - loss: 0.3038  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.3006  
Epoch 47/100  
504/504 [=====] - 0s 124us/step - loss: 0.2964  
Epoch 48/100  
504/504 [=====] - 0s 124us/step - loss: 0.2929  
Epoch 49/100  
504/504 [=====] - 0s 93us/step - loss: 0.2897  
Epoch 50/100  
504/504 [=====] - 0s 93us/step - loss: 0.2861  
Epoch 51/100  
504/504 [=====] - 0s 124us/step - loss: 0.2829  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.2796  
Epoch 53/100  
504/504 [=====] - 0s 124us/step - loss: 0.2762  
Epoch 54/100  
504/504 [=====] - 0s 124us/step - loss: 0.2729  
Epoch 55/100  
504/504 [=====] - 0s 124us/step - loss: 0.2700  
Epoch 56/100  
504/504 [=====] - 0s 93us/step - loss: 0.2667  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2638  
Epoch 58/100  
504/504 [=====] - 0s 124us/step - loss: 0.2609  
Epoch 59/100  
504/504 [=====] - 0s 124us/step - loss: 0.2581  
Epoch 60/100  
504/504 [=====] - 0s 124us/step - loss: 0.2544  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.2515

Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2479  
Epoch 63/100  
504/504 [=====] - 0s 93us/step - loss: 0.2445  
Epoch 64/100  
504/504 [=====] - 0s 124us/step - loss: 0.2416  
Epoch 65/100  
504/504 [=====] - 0s 124us/step - loss: 0.2382  
Epoch 66/100  
504/504 [=====] - 0s 124us/step - loss: 0.2349  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.2318  
Epoch 68/100  
504/504 [=====] - 0s 124us/step - loss: 0.2288  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2262  
Epoch 70/100  
504/504 [=====] - 0s 155us/step - loss: 0.2233  
Epoch 71/100  
504/504 [=====] - 0s 93us/step - loss: 0.2205  
Epoch 72/100  
504/504 [=====] - 0s 124us/step - loss: 0.2177  
Epoch 73/100  
504/504 [=====] - 0s 124us/step - loss: 0.2149  
Epoch 74/100  
504/504 [=====] - 0s 124us/step - loss: 0.2115  
Epoch 75/100  
504/504 [=====] - 0s 124us/step - loss: 0.2080  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.2047  
Epoch 77/100  
504/504 [=====] - 0s 93us/step - loss: 0.2012  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.1985  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.1957  
Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.1929  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.1910  
Epoch 82/100  
504/504 [=====] - 0s 124us/step - loss: 0.1885  
Epoch 83/100  
504/504 [=====] - 0s 124us/step - loss: 0.1858  
Epoch 84/100  
504/504 [=====] - 0s 124us/step - loss: 0.1838  
Epoch 85/100  
504/504 [=====] - 0s 93us/step - loss: 0.1822

Epoch 86/100  
504/504 [=====] - 0s 93us/step - loss: 0.1796  
Epoch 87/100  
504/504 [=====] - 0s 124us/step - loss: 0.1776  
Epoch 88/100  
504/504 [=====] - 0s 124us/step - loss: 0.1758  
Epoch 89/100  
504/504 [=====] - 0s 124us/step - loss: 0.1736  
Epoch 90/100  
504/504 [=====] - 0s 124us/step - loss: 0.1717  
Epoch 91/100  
504/504 [=====] - 0s 124us/step - loss: 0.1703  
Epoch 92/100  
504/504 [=====] - 0s 124us/step - loss: 0.1689  
Epoch 93/100  
504/504 [=====] - 0s 124us/step - loss: 0.1676  
Epoch 94/100  
504/504 [=====] - 0s 124us/step - loss: 0.1664  
Epoch 95/100  
504/504 [=====] - 0s 93us/step - loss: 0.1644  
Epoch 96/100  
504/504 [=====] - 0s 93us/step - loss: 0.1640  
Epoch 97/100  
504/504 [=====] - 0s 124us/step - loss: 0.1622  
Epoch 98/100  
504/504 [=====] - 0s 124us/step - loss: 0.1614  
Epoch 99/100  
504/504 [=====] - 0s 124us/step - loss: 0.1597  
Epoch 100/100  
504/504 [=====] - 0s 124us/step - loss: 0.1587  
Epoch 1/100  
504/504 [=====] - 4s 9ms/step - loss: 1.7603  
Epoch 2/100  
504/504 [=====] - 0s 126us/step - loss: 1.5617  
Epoch 3/100  
504/504 [=====] - 0s 124us/step - loss: 1.3868  
Epoch 4/100  
504/504 [=====] - 0s 124us/step - loss: 1.2436  
Epoch 5/100  
504/504 [=====] - 0s 93us/step - loss: 1.1308  
Epoch 6/100  
504/504 [=====] - 0s 124us/step - loss: 1.0335  
Epoch 7/100  
504/504 [=====] - 0s 124us/step - loss: 0.9488  
Epoch 8/100  
504/504 [=====] - 0s 93us/step - loss: 0.8812  
Epoch 9/100  
504/504 [=====] - 0s 124us/step - loss: 0.8239



Epoch 10/100  
504/504 [=====] - 0s 124us/step - loss: 0.7722  
Epoch 11/100  
504/504 [=====] - 0s 124us/step - loss: 0.7260  
Epoch 12/100  
504/504 [=====] - 0s 124us/step - loss: 0.6863  
Epoch 13/100  
504/504 [=====] - 0s 124us/step - loss: 0.6533  
Epoch 14/100  
504/504 [=====] - 0s 124us/step - loss: 0.6198  
Epoch 15/100  
504/504 [=====] - 0s 93us/step - loss: 0.5922  
Epoch 16/100  
504/504 [=====] - 0s 124us/step - loss: 0.5674  
Epoch 17/100  
504/504 [=====] - 0s 124us/step - loss: 0.5424  
Epoch 18/100  
504/504 [=====] - 0s 124us/step - loss: 0.5210  
Epoch 19/100  
504/504 [=====] - 0s 124us/step - loss: 0.5014  
Epoch 20/100  
504/504 [=====] - 0s 124us/step - loss: 0.4818  
Epoch 21/100  
504/504 [=====] - 0s 124us/step - loss: 0.4651  
Epoch 22/100  
504/504 [=====] - 0s 124us/step - loss: 0.4484  
Epoch 23/100  
504/504 [=====] - 0s 124us/step - loss: 0.4346  
Epoch 24/100  
504/504 [=====] - 0s 124us/step - loss: 0.4194  
Epoch 25/100  
504/504 [=====] - 0s 124us/step - loss: 0.4071  
Epoch 26/100  
504/504 [=====] - 0s 124us/step - loss: 0.3952  
Epoch 27/100  
504/504 [=====] - 0s 93us/step - loss: 0.3839  
Epoch 28/100  
504/504 [=====] - 0s 124us/step - loss: 0.3755  
Epoch 29/100  
504/504 [=====] - 0s 124us/step - loss: 0.3654  
Epoch 30/100  
504/504 [=====] - 0s 93us/step - loss: 0.3578  
Epoch 31/100  
504/504 [=====] - 0s 93us/step - loss: 0.3507  
Epoch 32/100  
504/504 [=====] - 0s 124us/step - loss: 0.3430  
Epoch 33/100  
504/504 [=====] - 0s 93us/step - loss: 0.3369

Epoch 34/100  
504/504 [=====] - 0s 93us/step - loss: 0.3310  
Epoch 35/100  
504/504 [=====] - 0s 124us/step - loss: 0.3251  
Epoch 36/100  
504/504 [=====] - 0s 124us/step - loss: 0.3192  
Epoch 37/100  
504/504 [=====] - 0s 93us/step - loss: 0.3140  
Epoch 38/100  
504/504 [=====] - 0s 93us/step - loss: 0.3088  
Epoch 39/100  
504/504 [=====] - 0s 124us/step - loss: 0.3037  
Epoch 40/100  
504/504 [=====] - 0s 124us/step - loss: 0.2991  
Epoch 41/100  
504/504 [=====] - 0s 124us/step - loss: 0.2943  
Epoch 42/100  
504/504 [=====] - 0s 124us/step - loss: 0.2898  
Epoch 43/100  
504/504 [=====] - 0s 124us/step - loss: 0.2858  
Epoch 44/100  
504/504 [=====] - 0s 124us/step - loss: 0.2817  
Epoch 45/100  
504/504 [=====] - 0s 139us/step - loss: 0.2781  
Epoch 46/100  
504/504 [=====] - 0s 93us/step - loss: 0.2743  
Epoch 47/100  
504/504 [=====] - 0s 124us/step - loss: 0.2710  
Epoch 48/100  
504/504 [=====] - 0s 124us/step - loss: 0.2666  
Epoch 49/100  
504/504 [=====] - 0s 124us/step - loss: 0.2634  
Epoch 50/100  
504/504 [=====] - 0s 124us/step - loss: 0.2605  
Epoch 51/100  
504/504 [=====] - 0s 93us/step - loss: 0.2566  
Epoch 52/100  
504/504 [=====] - 0s 124us/step - loss: 0.2532  
Epoch 53/100  
504/504 [=====] - 0s 124us/step - loss: 0.2500  
Epoch 54/100  
504/504 [=====] - 0s 124us/step - loss: 0.2469  
Epoch 55/100  
504/504 [=====] - 0s 124us/step - loss: 0.2435  
Epoch 56/100  
504/504 [=====] - 0s 124us/step - loss: 0.2402  
Epoch 57/100  
504/504 [=====] - 0s 124us/step - loss: 0.2371

Epoch 58/100  
504/504 [=====] - 0s 93us/step - loss: 0.2338  
Epoch 59/100  
504/504 [=====] - 0s 124us/step - loss: 0.2309  
Epoch 60/100  
504/504 [=====] - 0s 124us/step - loss: 0.2279  
Epoch 61/100  
504/504 [=====] - 0s 124us/step - loss: 0.2254  
Epoch 62/100  
504/504 [=====] - 0s 93us/step - loss: 0.2223  
Epoch 63/100  
504/504 [=====] - 0s 124us/step - loss: 0.2201  
Epoch 64/100  
504/504 [=====] - 0s 124us/step - loss: 0.2177  
Epoch 65/100  
504/504 [=====] - 0s 93us/step - loss: 0.2151  
Epoch 66/100  
504/504 [=====] - 0s 124us/step - loss: 0.2129  
Epoch 67/100  
504/504 [=====] - 0s 124us/step - loss: 0.2104  
Epoch 68/100  
504/504 [=====] - 0s 93us/step - loss: 0.2086  
Epoch 69/100  
504/504 [=====] - 0s 93us/step - loss: 0.2060  
Epoch 70/100  
504/504 [=====] - 0s 124us/step - loss: 0.2042  
Epoch 71/100  
504/504 [=====] - 0s 124us/step - loss: 0.2022  
Epoch 72/100  
504/504 [=====] - 0s 93us/step - loss: 0.2007  
Epoch 73/100  
504/504 [=====] - 0s 93us/step - loss: 0.1987  
Epoch 74/100  
504/504 [=====] - 0s 124us/step - loss: 0.1963  
Epoch 75/100  
504/504 [=====] - 0s 124us/step - loss: 0.1948  
Epoch 76/100  
504/504 [=====] - 0s 124us/step - loss: 0.1931  
Epoch 77/100  
504/504 [=====] - 0s 124us/step - loss: 0.1917  
Epoch 78/100  
504/504 [=====] - 0s 124us/step - loss: 0.1900  
Epoch 79/100  
504/504 [=====] - 0s 124us/step - loss: 0.1887  
Epoch 80/100  
504/504 [=====] - 0s 124us/step - loss: 0.1878  
Epoch 81/100  
504/504 [=====] - 0s 124us/step - loss: 0.1857

```

Epoch 82/100
504/504 [=====] - 0s 124us/step - loss: 0.1850
Epoch 83/100
504/504 [=====] - 0s 124us/step - loss: 0.1834
Epoch 84/100
504/504 [=====] - 0s 124us/step - loss: 0.1820
Epoch 85/100
504/504 [=====] - 0s 124us/step - loss: 0.1812
Epoch 86/100
504/504 [=====] - 0s 124us/step - loss: 0.1806
Epoch 87/100
504/504 [=====] - 0s 124us/step - loss: 0.1791
Epoch 88/100
504/504 [=====] - 0s 124us/step - loss: 0.1783
Epoch 89/100
504/504 [=====] - 0s 124us/step - loss: 0.1760
Epoch 90/100
504/504 [=====] - 0s 124us/step - loss: 0.1755
Epoch 91/100
504/504 [=====] - 0s 93us/step - loss: 0.1747
Epoch 92/100
504/504 [=====] - 0s 124us/step - loss: 0.1738
Epoch 93/100
504/504 [=====] - 0s 124us/step - loss: 0.1724
Epoch 94/100
504/504 [=====] - 0s 124us/step - loss: 0.1719
Epoch 95/100
504/504 [=====] - 0s 124us/step - loss: 0.1709
Epoch 96/100
504/504 [=====] - 0s 93us/step - loss: 0.1698
Epoch 97/100
504/504 [=====] - 0s 124us/step - loss: 0.1695
Epoch 98/100
504/504 [=====] - ETA: 0s - loss: 0.176 - 0s 125us/step
- loss: 0.1683
Epoch 99/100
504/504 [=====] - 0s 93us/step - loss: 0.1679
Epoch 100/100
504/504 [=====] - 0s 124us/step - loss: 0.1666

```

```
[71]: print("A list of 50 Normalised mean squared errors using 100 epochs:", n)
```

```

A list of 50 Normalised mean squared errors using 100 epochs:
[0.19751414305740733, 0.15600358519171825, 0.1924612939476936,
0.1743128975675669, 0.21105318952049268, 0.20098885916670026,
0.19855510743064014, 0.23684258463279845, 0.21254012083673626,
0.23508146586926876, 0.1694036425193086, 0.15875069353561652,

```

```
0.15455538226484727, 0.15950617301677744, 0.2306343649405648,
0.20136478046905198, 0.2066927151774918, 0.2053223825055721,
0.24999765740782062, 0.17166280774447965, 0.14423132856293913,
0.21025964237899314, 0.19492829338263537, 0.15767081933410276,
0.1978750284168594, 0.19309932846243769, 0.18187150859387216,
0.16856533060202092, 0.18029015935112405, 0.19824960877636152,
0.235925896900506, 0.1611196731330439, 0.19256810439945202, 0.16687694731794517,
0.2545995217169294, 0.1792142478688727, 0.17590898439993338,
0.20059219575482148, 0.1461817467225196, 0.17261445018326013,
0.16630725998577148, 0.20579305199263026, 0.19175525713620856,
0.16513744854473442, 0.22523444524419986, 0.16841876230633196,
0.15764766610774986, 0.3101570191360207, 0.19217704809925856,
0.18210578854005974]
```

```
[72]: nnew = scaler.inverse_transform(n)
```

```
[73]: nnew
```

```
[73]: array([39.20726069, 38.50245739, 39.1214689 , 38.81332924, 39.4371387 ,
        39.26625752, 39.22493511, 39.87501406, 39.46238514, 39.84511221,
        38.72997552, 38.54910025, 38.47786851, 38.56192746, 39.76960537,
        39.27264024, 39.36310267, 39.33983594, 40.09837262, 38.76833365,
        38.30257752, 39.42366515, 39.16335582, 38.53076518, 39.21338812,
        39.13230202, 38.94166608, 38.71574192, 38.91481652, 39.21974808,
        39.85944972, 38.5893229 , 39.12328243, 38.68707504, 40.17650718,
        38.89654874, 38.84042902, 39.25952261, 38.33569346, 38.78449148,
        38.67740238, 39.34782739, 39.10948118, 38.65754028, 39.67792071,
        38.71325335, 38.53037207, 41.11981195, 39.11664273, 38.94564389])
```

```
[74]: sn = sum(nnew)
```

```
[75]: sn.mean()
```

```
[75]: 1955.6923660995276
```

Mean of the mean squared errors compare to that from Step B is lower for epoch 100. 1955.69 versus 2046.69

#### 0.0.11 D. Increase the number of hidden layers

```
[77]: # define new model
def new_model():
    # create model
    model = Sequential()
    model.add(Dense(10, input_dim=8, activation='relu'))
    model.add(Dense(10, activation='relu'))
    model.add(Dense(10, activation='relu'))
    model.add(Dense(1))
    # Compile model
    model.compile(loss='mean_squared_error', optimizer='adam')
```

```
return model
```

[78]: *#This is to test the new model first using normalized values*

```
model4 = new_model()  
model4.fit(X_train_scaled,y_train_scaled,epochs=50)
```

```
Epoch 1/50  
721/721 [=====] - 5s 7ms/step - loss: 1.1269  
Epoch 2/50  
721/721 [=====] - 0s 130us/step - loss: 1.0289  
Epoch 3/50  
721/721 [=====] - 0s 130us/step - loss: 0.9746  
Epoch 4/50  
721/721 [=====] - 0s 130us/step - loss: 0.9116  
Epoch 5/50  
721/721 [=====] - 0s 130us/step - loss: 0.8450  
Epoch 6/50  
721/721 [=====] - 0s 130us/step - loss: 0.7609  
Epoch 7/50  
721/721 [=====] - 0s 152us/step - loss: 0.6775  
Epoch 8/50  
721/721 [=====] - 0s 130us/step - loss: 0.5955  
Epoch 9/50  
721/721 [=====] - 0s 152us/step - loss: 0.5283  
Epoch 10/50  
721/721 [=====] - 0s 173us/step - loss: 0.4708  
Epoch 11/50  
721/721 [=====] - 0s 152us/step - loss: 0.4236  
Epoch 12/50  
721/721 [=====] - 0s 152us/step - loss: 0.3886  
Epoch 13/50  
721/721 [=====] - 0s 152us/step - loss: 0.3592  
Epoch 14/50  
721/721 [=====] - 0s 152us/step - loss: 0.3363  
Epoch 15/50  
721/721 [=====] - 0s 152us/step - loss: 0.3130  
Epoch 16/50  
721/721 [=====] - 0s 173us/step - loss: 0.2936  
Epoch 17/50  
721/721 [=====] - 0s 130us/step - loss: 0.2792  
Epoch 18/50  
721/721 [=====] - 0s 152us/step - loss: 0.2614  
Epoch 19/50  
721/721 [=====] - 0s 130us/step - loss: 0.2482  
Epoch 20/50  
721/721 [=====] - 0s 152us/step - loss: 0.2383  
Epoch 21/50  
721/721 [=====] - 0s 130us/step - loss: 0.2287
```

Epoch 22/50  
721/721 [=====] - 0s 152us/step - loss: 0.2207  
Epoch 23/50  
721/721 [=====] - 0s 130us/step - loss: 0.2157  
Epoch 24/50  
721/721 [=====] - 0s 130us/step - loss: 0.2070  
Epoch 25/50  
721/721 [=====] - 0s 173us/step - loss: 0.2013  
Epoch 26/50  
721/721 [=====] - 0s 174us/step - loss: 0.1966  
Epoch 27/50  
721/721 [=====] - 0s 173us/step - loss: 0.1913  
Epoch 28/50  
721/721 [=====] - 0s 195us/step - loss: 0.1876  
Epoch 29/50  
721/721 [=====] - 0s 152us/step - loss: 0.1834  
Epoch 30/50  
721/721 [=====] - 0s 130us/step - loss: 0.1773  
Epoch 31/50  
721/721 [=====] - 0s 108us/step - loss: 0.1748  
Epoch 32/50  
721/721 [=====] - 0s 195us/step - loss: 0.1712  
Epoch 33/50  
721/721 [=====] - 0s 152us/step - loss: 0.1683  
Epoch 34/50  
721/721 [=====] - 0s 152us/step - loss: 0.1654  
Epoch 35/50  
721/721 [=====] - 0s 152us/step - loss: 0.1620  
Epoch 36/50  
721/721 [=====] - 0s 152us/step - loss: 0.1596  
Epoch 37/50  
721/721 [=====] - 0s 173us/step - loss: 0.1558  
Epoch 38/50  
721/721 [=====] - 0s 152us/step - loss: 0.1537  
Epoch 39/50  
721/721 [=====] - 0s 152us/step - loss: 0.1526  
Epoch 40/50  
721/721 [=====] - 0s 173us/step - loss: 0.1498  
Epoch 41/50  
721/721 [=====] - 0s 130us/step - loss: 0.1483  
Epoch 42/50  
721/721 [=====] - 0s 152us/step - loss: 0.1469  
Epoch 43/50  
721/721 [=====] - 0s 152us/step - loss: 0.1461  
Epoch 44/50  
721/721 [=====] - 0s 173us/step - loss: 0.1446  
Epoch 45/50  
721/721 [=====] - 0s 152us/step - loss: 0.1436

```
Epoch 46/50
721/721 [=====] - 0s 152us/step - loss: 0.1425
Epoch 47/50
721/721 [=====] - 0s 152us/step - loss: 0.1398
Epoch 48/50
721/721 [=====] - 0s 173us/step - loss: 0.1388
Epoch 49/50
721/721 [=====] - 0s 152us/step - loss: 0.1378
Epoch 50/50
721/721 [=====] - 0s 130us/step - loss: 0.1371
```

[78]: <keras.callbacks.History at 0x1fe831d4390>

[79]: model4.summary()

Model: "sequential\_154"

Layer (type)	Output Shape	Param #
dense_307 (Dense)	(None, 10)	90
dense_308 (Dense)	(None, 10)	110
dense_309 (Dense)	(None, 10)	110
dense_310 (Dense)	(None, 1)	11

Total params: 321  
 Trainable params: 321  
 Non-trainable params: 0

```
[82]: o = []

for i in range(1,51):
    X_train, X_test, y_train, y_test =
    →train_test_split(X_train_scaled,y_train_scaled, test_size=0.3,
    →random_state=0)
    model4 = new_model()
    model4.fit(X_train,y_train,epochs=50)
    y_pred = model4.predict(X_test)
    mse = mean_squared_error(y_test,y_pred)
    o.append(mse)
```

```
Epoch 1/50
504/504 [=====] - 5s 10ms/step - loss: 1.1247
Epoch 2/50
```



504/504 [=====] - 0s 155us/step - loss: 0.9830  
Epoch 3/50  
504/504 [=====] - 0s 186us/step - loss: 0.8982  
Epoch 4/50  
504/504 [=====] - 0s 186us/step - loss: 0.8327  
Epoch 5/50  
504/504 [=====] - 0s 155us/step - loss: 0.7724  
Epoch 6/50  
504/504 [=====] - 0s 155us/step - loss: 0.7134  
Epoch 7/50  
504/504 [=====] - 0s 155us/step - loss: 0.6513  
Epoch 8/50  
504/504 [=====] - 0s 155us/step - loss: 0.5891  
Epoch 9/50  
504/504 [=====] - 0s 124us/step - loss: 0.5254  
Epoch 10/50  
504/504 [=====] - 0s 186us/step - loss: 0.4688  
Epoch 11/50  
504/504 [=====] - 0s 186us/step - loss: 0.4175  
Epoch 12/50  
504/504 [=====] - 0s 155us/step - loss: 0.3745  
Epoch 13/50  
504/504 [=====] - 0s 187us/step - loss: 0.3460  
Epoch 14/50  
504/504 [=====] - 0s 124us/step - loss: 0.3297  
Epoch 15/50  
504/504 [=====] - 0s 124us/step - loss: 0.3147  
Epoch 16/50  
504/504 [=====] - 0s 124us/step - loss: 0.3038  
Epoch 17/50  
504/504 [=====] - 0s 155us/step - loss: 0.2954  
Epoch 18/50  
504/504 [=====] - 0s 155us/step - loss: 0.2849  
Epoch 19/50  
504/504 [=====] - 0s 186us/step - loss: 0.2770  
Epoch 20/50  
504/504 [=====] - 0s 124us/step - loss: 0.2698  
Epoch 21/50  
504/504 [=====] - 0s 155us/step - loss: 0.2630  
Epoch 22/50  
504/504 [=====] - 0s 124us/step - loss: 0.2581  
Epoch 23/50  
504/504 [=====] - 0s 155us/step - loss: 0.2507  
Epoch 24/50  
504/504 [=====] - 0s 186us/step - loss: 0.2466  
Epoch 25/50  
504/504 [=====] - 0s 155us/step - loss: 0.2415  
Epoch 26/50

504/504 [=====] - 0s 186us/step - loss: 0.2375  
Epoch 27/50  
504/504 [=====] - 0s 124us/step - loss: 0.2339  
Epoch 28/50  
504/504 [=====] - 0s 155us/step - loss: 0.2287  
Epoch 29/50  
504/504 [=====] - 0s 124us/step - loss: 0.2250  
Epoch 30/50  
504/504 [=====] - 0s 155us/step - loss: 0.2214  
Epoch 31/50  
504/504 [=====] - 0s 186us/step - loss: 0.2177  
Epoch 32/50  
504/504 [=====] - 0s 155us/step - loss: 0.2143  
Epoch 33/50  
504/504 [=====] - 0s 155us/step - loss: 0.2108  
Epoch 34/50  
504/504 [=====] - 0s 155us/step - loss: 0.2089  
Epoch 35/50  
504/504 [=====] - 0s 124us/step - loss: 0.2047  
Epoch 36/50  
504/504 [=====] - 0s 124us/step - loss: 0.2019  
Epoch 37/50  
504/504 [=====] - 0s 155us/step - loss: 0.1993  
Epoch 38/50  
504/504 [=====] - 0s 124us/step - loss: 0.1969  
Epoch 39/50  
504/504 [=====] - 0s 124us/step - loss: 0.1932  
Epoch 40/50  
504/504 [=====] - 0s 155us/step - loss: 0.1919  
Epoch 41/50  
504/504 [=====] - 0s 124us/step - loss: 0.1889  
Epoch 42/50  
504/504 [=====] - 0s 155us/step - loss: 0.1866  
Epoch 43/50  
504/504 [=====] - 0s 124us/step - loss: 0.1836  
Epoch 44/50  
504/504 [=====] - 0s 124us/step - loss: 0.1829  
Epoch 45/50  
504/504 [=====] - 0s 155us/step - loss: 0.1810  
Epoch 46/50  
504/504 [=====] - 0s 124us/step - loss: 0.1767  
Epoch 47/50  
504/504 [=====] - 0s 186us/step - loss: 0.1745  
Epoch 48/50  
504/504 [=====] - 0s 155us/step - loss: 0.1708  
Epoch 49/50  
504/504 [=====] - 0s 155us/step - loss: 0.1683  
Epoch 50/50

504/504 [=====] - 0s 186us/step - loss: 0.1669  
Epoch 1/50  
504/504 [=====] - 6s 11ms/step - loss: 1.0493  
Epoch 2/50  
504/504 [=====] - 0s 155us/step - loss: 1.0042  
Epoch 3/50  
504/504 [=====] - 0s 217us/step - loss: 0.9736  
Epoch 4/50  
504/504 [=====] - 0s 155us/step - loss: 0.9456  
Epoch 5/50  
504/504 [=====] - 0s 155us/step - loss: 0.9163  
Epoch 6/50  
504/504 [=====] - 0s 186us/step - loss: 0.8809  
Epoch 7/50  
504/504 [=====] - 0s 155us/step - loss: 0.8390  
Epoch 8/50  
504/504 [=====] - 0s 124us/step - loss: 0.7862  
Epoch 9/50  
504/504 [=====] - 0s 155us/step - loss: 0.7260  
Epoch 10/50  
504/504 [=====] - 0s 155us/step - loss: 0.6585  
Epoch 11/50  
504/504 [=====] - 0s 155us/step - loss: 0.5900  
Epoch 12/50  
504/504 [=====] - 0s 155us/step - loss: 0.5256  
Epoch 13/50  
504/504 [=====] - 0s 186us/step - loss: 0.4749  
Epoch 14/50  
504/504 [=====] - 0s 124us/step - loss: 0.4390  
Epoch 15/50  
504/504 [=====] - 0s 186us/step - loss: 0.4147  
Epoch 16/50  
504/504 [=====] - 0s 124us/step - loss: 0.3942  
Epoch 17/50  
504/504 [=====] - 0s 186us/step - loss: 0.3796  
Epoch 18/50  
504/504 [=====] - 0s 186us/step - loss: 0.3609  
Epoch 19/50  
504/504 [=====] - 0s 186us/step - loss: 0.3450  
Epoch 20/50  
504/504 [=====] - 0s 155us/step - loss: 0.3331  
Epoch 21/50  
504/504 [=====] - 0s 155us/step - loss: 0.3177  
Epoch 22/50  
504/504 [=====] - 0s 155us/step - loss: 0.3043  
Epoch 23/50  
504/504 [=====] - 0s 124us/step - loss: 0.2923  
Epoch 24/50

504/504 [=====] - 0s 155us/step - loss: 0.2829  
Epoch 25/50  
504/504 [=====] - 0s 155us/step - loss: 0.2738  
Epoch 26/50  
504/504 [=====] - 0s 186us/step - loss: 0.2660  
Epoch 27/50  
504/504 [=====] - 0s 217us/step - loss: 0.2560  
Epoch 28/50  
504/504 [=====] - 0s 186us/step - loss: 0.2492  
Epoch 29/50  
504/504 [=====] - 0s 155us/step - loss: 0.2446  
Epoch 30/50  
504/504 [=====] - 0s 155us/step - loss: 0.2371  
Epoch 31/50  
504/504 [=====] - 0s 186us/step - loss: 0.2325  
Epoch 32/50  
504/504 [=====] - 0s 217us/step - loss: 0.2267  
Epoch 33/50  
504/504 [=====] - 0s 155us/step - loss: 0.2219  
Epoch 34/50  
504/504 [=====] - 0s 124us/step - loss: 0.2166  
Epoch 35/50  
504/504 [=====] - 0s 155us/step - loss: 0.2127  
Epoch 36/50  
504/504 [=====] - 0s 155us/step - loss: 0.2089  
Epoch 37/50  
504/504 [=====] - 0s 155us/step - loss: 0.2047  
Epoch 38/50  
504/504 [=====] - 0s 217us/step - loss: 0.2005  
Epoch 39/50  
504/504 [=====] - 0s 186us/step - loss: 0.1967  
Epoch 40/50  
504/504 [=====] - 0s 186us/step - loss: 0.1922  
Epoch 41/50  
504/504 [=====] - 0s 155us/step - loss: 0.1892  
Epoch 42/50  
504/504 [=====] - 0s 155us/step - loss: 0.1855  
Epoch 43/50  
504/504 [=====] - 0s 186us/step - loss: 0.1834  
Epoch 44/50  
504/504 [=====] - 0s 155us/step - loss: 0.1816  
Epoch 45/50  
504/504 [=====] - 0s 186us/step - loss: 0.1784  
Epoch 46/50  
504/504 [=====] - 0s 186us/step - loss: 0.1746  
Epoch 47/50  
504/504 [=====] - 0s 155us/step - loss: 0.1730  
Epoch 48/50

504/504 [=====] - 0s 155us/step - loss: 0.1699  
Epoch 49/50  
504/504 [=====] - 0s 155us/step - loss: 0.1678  
Epoch 50/50  
504/504 [=====] - 0s 124us/step - loss: 0.1654  
Epoch 1/50  
504/504 [=====] - 5s 11ms/step - loss: 1.5058  
Epoch 2/50  
504/504 [=====] - 0s 155us/step - loss: 1.1180  
Epoch 3/50  
504/504 [=====] - 0s 124us/step - loss: 0.9636  
Epoch 4/50  
504/504 [=====] - 0s 155us/step - loss: 0.8860  
Epoch 5/50  
504/504 [=====] - 0s 155us/step - loss: 0.8357  
Epoch 6/50  
504/504 [=====] - 0s 124us/step - loss: 0.7813  
Epoch 7/50  
504/504 [=====] - 0s 155us/step - loss: 0.7191  
Epoch 8/50  
504/504 [=====] - 0s 155us/step - loss: 0.6592  
Epoch 9/50  
504/504 [=====] - 0s 155us/step - loss: 0.5977  
Epoch 10/50  
504/504 [=====] - 0s 124us/step - loss: 0.5466  
Epoch 11/50  
504/504 [=====] - 0s 155us/step - loss: 0.5054  
Epoch 12/50  
504/504 [=====] - 0s 124us/step - loss: 0.4725  
Epoch 13/50  
504/504 [=====] - 0s 155us/step - loss: 0.4502  
Epoch 14/50  
504/504 [=====] - 0s 124us/step - loss: 0.4307  
Epoch 15/50  
504/504 [=====] - 0s 155us/step - loss: 0.4129  
Epoch 16/50  
504/504 [=====] - 0s 124us/step - loss: 0.4010  
Epoch 17/50  
504/504 [=====] - 0s 155us/step - loss: 0.3870  
Epoch 18/50  
504/504 [=====] - 0s 124us/step - loss: 0.3776  
Epoch 19/50  
504/504 [=====] - 0s 155us/step - loss: 0.3651  
Epoch 20/50  
504/504 [=====] - 0s 124us/step - loss: 0.3542  
Epoch 21/50  
504/504 [=====] - 0s 155us/step - loss: 0.3446  
Epoch 22/50

504/504 [=====] - 0s 155us/step - loss: 0.3356  
 Epoch 23/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3282  
 Epoch 24/50  
 504/504 [=====] - 0s 156us/step - loss: 0.3203  
 Epoch 25/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3156  
 Epoch 26/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3083  
 Epoch 27/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3046  
 Epoch 28/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2987  
 Epoch 29/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2939  
 Epoch 30/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2892  
 Epoch 31/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2850  
 Epoch 32/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2813  
 Epoch 33/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2780  
 Epoch 34/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2748  
 Epoch 35/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2708  
 Epoch 36/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2708  
 Epoch 37/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2674  
 Epoch 38/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2623  
 Epoch 39/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2595  
 Epoch 40/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2569  
 Epoch 41/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2545  
 Epoch 42/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2517  
 Epoch 43/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2508  
 Epoch 44/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2479  
 Epoch 45/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2456  
 Epoch 46/50

504/504 [=====] - 0s 155us/step - loss: 0.2417  
 Epoch 47/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2403  
 Epoch 48/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2384  
 Epoch 49/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2338  
 Epoch 50/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2313  
 Epoch 1/50  
 504/504 [=====] - 5s 10ms/step - loss: 1.1378  
 Epoch 2/50  
 504/504 [=====] - 0s 155us/step - loss: 0.9855  
 Epoch 3/50  
 504/504 [=====] - 0s 155us/step - loss: 0.9069  
 Epoch 4/50  
 504/504 [=====] - 0s 155us/step - loss: 0.8488  
 Epoch 5/50  
 504/504 [=====] - 0s 156us/step - loss: 0.7986  
 Epoch 6/50  
 504/504 [=====] - 0s 155us/step - loss: 0.7513  
 Epoch 7/50  
 504/504 [=====] - 0s 155us/step - loss: 0.7051  
 Epoch 8/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6589  
 Epoch 9/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6068  
 Epoch 10/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5531  
 Epoch 11/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5059  
 Epoch 12/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4616  
 Epoch 13/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4257  
 Epoch 14/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4008  
 Epoch 15/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3790  
 Epoch 16/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3598  
 Epoch 17/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3426  
 Epoch 18/50  
 504/504 [=====] - 0s 124us/step - loss: 0.3297  
 Epoch 19/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3155  
 Epoch 20/50

504/504 [=====] - 0s 155us/step - loss: 0.3049  
Epoch 21/50  
504/504 [=====] - 0s 155us/step - loss: 0.2949  
Epoch 22/50  
504/504 [=====] - 0s 155us/step - loss: 0.2855  
Epoch 23/50  
504/504 [=====] - 0s 186us/step - loss: 0.2760  
Epoch 24/50  
504/504 [=====] - 0s 124us/step - loss: 0.2672  
Epoch 25/50  
504/504 [=====] - 0s 155us/step - loss: 0.2601  
Epoch 26/50  
504/504 [=====] - 0s 155us/step - loss: 0.2517  
Epoch 27/50  
504/504 [=====] - 0s 155us/step - loss: 0.2436  
Epoch 28/50  
504/504 [=====] - 0s 155us/step - loss: 0.2385  
Epoch 29/50  
504/504 [=====] - 0s 155us/step - loss: 0.2299  
Epoch 30/50  
504/504 [=====] - 0s 124us/step - loss: 0.2235  
Epoch 31/50  
504/504 [=====] - 0s 186us/step - loss: 0.2189  
Epoch 32/50  
504/504 [=====] - 0s 155us/step - loss: 0.2129  
Epoch 33/50  
504/504 [=====] - 0s 155us/step - loss: 0.2088  
Epoch 34/50  
504/504 [=====] - 0s 155us/step - loss: 0.2093  
Epoch 35/50  
504/504 [=====] - 0s 217us/step - loss: 0.2004  
Epoch 36/50  
504/504 [=====] - 0s 155us/step - loss: 0.1932  
Epoch 37/50  
504/504 [=====] - 0s 124us/step - loss: 0.1900  
Epoch 38/50  
504/504 [=====] - 0s 124us/step - loss: 0.1863  
Epoch 39/50  
504/504 [=====] - 0s 155us/step - loss: 0.1829  
Epoch 40/50  
504/504 [=====] - 0s 124us/step - loss: 0.1786  
Epoch 41/50  
504/504 [=====] - 0s 155us/step - loss: 0.1757  
Epoch 42/50  
504/504 [=====] - 0s 155us/step - loss: 0.1724  
Epoch 43/50  
504/504 [=====] - 0s 124us/step - loss: 0.1707  
Epoch 44/50



504/504 [=====] - 0s 186us/step - loss: 0.1692  
Epoch 45/50  
504/504 [=====] - 0s 186us/step - loss: 0.1656  
Epoch 46/50  
504/504 [=====] - 0s 186us/step - loss: 0.1638  
Epoch 47/50  
504/504 [=====] - 0s 155us/step - loss: 0.1616  
Epoch 48/50  
504/504 [=====] - 0s 155us/step - loss: 0.1592  
Epoch 49/50  
504/504 [=====] - 0s 124us/step - loss: 0.1573  
Epoch 50/50  
504/504 [=====] - 0s 155us/step - loss: 0.1557  
Epoch 1/50  
504/504 [=====] - 5s 11ms/step - loss: 1.0871  
Epoch 2/50  
504/504 [=====] - 0s 124us/step - loss: 0.9492  
Epoch 3/50  
504/504 [=====] - 0s 124us/step - loss: 0.8792  
Epoch 4/50  
504/504 [=====] - 0s 124us/step - loss: 0.8175  
Epoch 5/50  
504/504 [=====] - 0s 124us/step - loss: 0.7628  
Epoch 6/50  
504/504 [=====] - 0s 124us/step - loss: 0.7032  
Epoch 7/50  
504/504 [=====] - 0s 124us/step - loss: 0.6469  
Epoch 8/50  
504/504 [=====] - 0s 124us/step - loss: 0.5932  
Epoch 9/50  
504/504 [=====] - 0s 155us/step - loss: 0.5535  
Epoch 10/50  
504/504 [=====] - 0s 124us/step - loss: 0.5151  
Epoch 11/50  
504/504 [=====] - 0s 155us/step - loss: 0.4863  
Epoch 12/50  
504/504 [=====] - 0s 124us/step - loss: 0.4603  
Epoch 13/50  
504/504 [=====] - 0s 124us/step - loss: 0.4384  
Epoch 14/50  
504/504 [=====] - 0s 155us/step - loss: 0.4164  
Epoch 15/50  
504/504 [=====] - 0s 124us/step - loss: 0.3930  
Epoch 16/50  
504/504 [=====] - 0s 124us/step - loss: 0.3721  
Epoch 17/50  
504/504 [=====] - 0s 124us/step - loss: 0.3517  
Epoch 18/50

504/504 [=====] - 0s 124us/step - loss: 0.3341  
Epoch 19/50  
504/504 [=====] - 0s 155us/step - loss: 0.3165  
Epoch 20/50  
504/504 [=====] - 0s 124us/step - loss: 0.3006  
Epoch 21/50  
504/504 [=====] - 0s 124us/step - loss: 0.2874  
Epoch 22/50  
504/504 [=====] - 0s 124us/step - loss: 0.2744  
Epoch 23/50  
504/504 [=====] - 0s 124us/step - loss: 0.2644  
Epoch 24/50  
504/504 [=====] - 0s 124us/step - loss: 0.2537  
Epoch 25/50  
504/504 [=====] - 0s 124us/step - loss: 0.2457  
Epoch 26/50  
504/504 [=====] - 0s 155us/step - loss: 0.2374  
Epoch 27/50  
504/504 [=====] - 0s 155us/step - loss: 0.2290  
Epoch 28/50  
504/504 [=====] - 0s 124us/step - loss: 0.2238  
Epoch 29/50  
504/504 [=====] - 0s 155us/step - loss: 0.2168  
Epoch 30/50  
504/504 [=====] - 0s 124us/step - loss: 0.2120  
Epoch 31/50  
504/504 [=====] - 0s 155us/step - loss: 0.2059  
Epoch 32/50  
504/504 [=====] - 0s 155us/step - loss: 0.1994  
Epoch 33/50  
504/504 [=====] - 0s 124us/step - loss: 0.1955  
Epoch 34/50  
504/504 [=====] - 0s 155us/step - loss: 0.1912  
Epoch 35/50  
504/504 [=====] - 0s 155us/step - loss: 0.1885  
Epoch 36/50  
504/504 [=====] - 0s 155us/step - loss: 0.1821  
Epoch 37/50  
504/504 [=====] - 0s 155us/step - loss: 0.1796  
Epoch 38/50  
504/504 [=====] - 0s 124us/step - loss: 0.1764  
Epoch 39/50  
504/504 [=====] - 0s 124us/step - loss: 0.1725  
Epoch 40/50  
504/504 [=====] - 0s 124us/step - loss: 0.1716  
Epoch 41/50  
504/504 [=====] - 0s 155us/step - loss: 0.1684  
Epoch 42/50

504/504 [=====] - 0s 155us/step - loss: 0.1648  
 Epoch 43/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1623  
 Epoch 44/50  
 504/504 [=====] - 0s 186us/step - loss: 0.1598  
 Epoch 45/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1575  
 Epoch 46/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1550  
 Epoch 47/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1542  
 Epoch 48/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1518  
 Epoch 49/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1491  
 Epoch 50/50  
 504/504 [=====] - 0s 186us/step - loss: 0.1487  
 Epoch 1/50  
 504/504 [=====] - 6s 11ms/step - loss: 1.2489  
 Epoch 2/50  
 504/504 [=====] - 0s 155us/step - loss: 1.0660  
 Epoch 3/50  
 504/504 [=====] - 0s 155us/step - loss: 0.9709  
 Epoch 4/50  
 504/504 [=====] - 0s 186us/step - loss: 0.9051  
 Epoch 5/50  
 504/504 [=====] - 0s 155us/step - loss: 0.8508  
 Epoch 6/50  
 504/504 [=====] - 0s 124us/step - loss: 0.7996  
 Epoch 7/50  
 504/504 [=====] - 0s 155us/step - loss: 0.7532  
 Epoch 8/50  
 504/504 [=====] - 0s 124us/step - loss: 0.7113  
 Epoch 9/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6706  
 Epoch 10/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6352  
 Epoch 11/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6032  
 Epoch 12/50  
 504/504 [=====] - 0s 124us/step - loss: 0.5778  
 Epoch 13/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5550  
 Epoch 14/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5347  
 Epoch 15/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5160  
 Epoch 16/50

504/504 [=====] - 0s 124us/step - loss: 0.4997  
 Epoch 17/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4840  
 Epoch 18/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4675  
 Epoch 19/50  
 504/504 [=====] - 0s 124us/step - loss: 0.4503  
 Epoch 20/50  
 504/504 [=====] - 0s 124us/step - loss: 0.4320  
 Epoch 21/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4176  
 Epoch 22/50  
 504/504 [=====] - 0s 124us/step - loss: 0.3992  
 Epoch 23/50  
 504/504 [=====] - 0s 124us/step - loss: 0.3849  
 Epoch 24/50  
 504/504 [=====] - 0s 124us/step - loss: 0.3709  
 Epoch 25/50  
 504/504 [=====] - 0s 124us/step - loss: 0.3569  
 Epoch 26/50  
 504/504 [=====] - 0s 124us/step - loss: 0.3447  
 Epoch 27/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3325  
 Epoch 28/50  
 504/504 [=====] - 0s 124us/step - loss: 0.3222  
 Epoch 29/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3119  
 Epoch 30/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3032  
 Epoch 31/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2934  
 Epoch 32/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2866  
 Epoch 33/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2782  
 Epoch 34/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2718  
 Epoch 35/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2651  
 Epoch 36/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2603  
 Epoch 37/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2545  
 Epoch 38/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2487  
 Epoch 39/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2431  
 Epoch 40/50

504/504 [=====] - 0s 124us/step - loss: 0.2375  
 Epoch 41/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2323  
 Epoch 42/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2288  
 Epoch 43/50  
 504/504 [=====] - 0s 132us/step - loss: 0.2216  
 Epoch 44/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2181  
 Epoch 45/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2141  
 Epoch 46/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2092  
 Epoch 47/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2068  
 Epoch 48/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2022  
 Epoch 49/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2006  
 Epoch 50/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1981  
 Epoch 1/50  
 504/504 [=====] - 6s 11ms/step - loss: 1.1970  
 Epoch 2/50  
 504/504 [=====] - 0s 186us/step - loss: 1.0840  
 Epoch 3/50  
 504/504 [=====] - 0s 155us/step - loss: 1.0219  
 Epoch 4/50  
 504/504 [=====] - 0s 124us/step - loss: 0.9817  
 Epoch 5/50  
 504/504 [=====] - 0s 124us/step - loss: 0.9532  
 Epoch 6/50  
 504/504 [=====] - 0s 124us/step - loss: 0.9254  
 Epoch 7/50  
 504/504 [=====] - 0s 155us/step - loss: 0.8978  
 Epoch 8/50  
 504/504 [=====] - 0s 124us/step - loss: 0.8676  
 Epoch 9/50  
 504/504 [=====] - 0s 155us/step - loss: 0.8358  
 Epoch 10/50  
 504/504 [=====] - 0s 124us/step - loss: 0.8006  
 Epoch 11/50  
 504/504 [=====] - 0s 156us/step - loss: 0.7658  
 Epoch 12/50  
 504/504 [=====] - 0s 155us/step - loss: 0.7328  
 Epoch 13/50  
 504/504 [=====] - 0s 186us/step - loss: 0.6973  
 Epoch 14/50

504/504 [=====] - 0s 155us/step - loss: 0.6627  
Epoch 15/50  
504/504 [=====] - 0s 155us/step - loss: 0.6273  
Epoch 16/50  
504/504 [=====] - 0s 186us/step - loss: 0.5909  
Epoch 17/50  
504/504 [=====] - 0s 155us/step - loss: 0.5567  
Epoch 18/50  
504/504 [=====] - 0s 155us/step - loss: 0.5259  
Epoch 19/50  
504/504 [=====] - 0s 186us/step - loss: 0.4924  
Epoch 20/50  
504/504 [=====] - 0s 155us/step - loss: 0.4641  
Epoch 21/50  
504/504 [=====] - 0s 186us/step - loss: 0.4402  
Epoch 22/50  
504/504 [=====] - 0s 155us/step - loss: 0.4191  
Epoch 23/50  
504/504 [=====] - 0s 155us/step - loss: 0.4005  
Epoch 24/50  
504/504 [=====] - 0s 155us/step - loss: 0.3863  
Epoch 25/50  
504/504 [=====] - 0s 155us/step - loss: 0.3723  
Epoch 26/50  
504/504 [=====] - 0s 155us/step - loss: 0.3584  
Epoch 27/50  
504/504 [=====] - 0s 155us/step - loss: 0.3481  
Epoch 28/50  
504/504 [=====] - 0s 155us/step - loss: 0.3357  
Epoch 29/50  
504/504 [=====] - 0s 124us/step - loss: 0.3274  
Epoch 30/50  
504/504 [=====] - 0s 124us/step - loss: 0.3195  
Epoch 31/50  
504/504 [=====] - 0s 155us/step - loss: 0.3089  
Epoch 32/50  
504/504 [=====] - 0s 155us/step - loss: 0.3004  
Epoch 33/50  
504/504 [=====] - 0s 155us/step - loss: 0.2919  
Epoch 34/50  
504/504 [=====] - 0s 186us/step - loss: 0.2849  
Epoch 35/50  
504/504 [=====] - 0s 156us/step - loss: 0.2768  
Epoch 36/50  
504/504 [=====] - 0s 155us/step - loss: 0.2700  
Epoch 37/50  
504/504 [=====] - 0s 155us/step - loss: 0.2634  
Epoch 38/50

504/504 [=====] - 0s 124us/step - loss: 0.2591  
 Epoch 39/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2503  
 Epoch 40/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2441  
 Epoch 41/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2397  
 Epoch 42/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2341  
 Epoch 43/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2296  
 Epoch 44/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2253  
 Epoch 45/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2206  
 Epoch 46/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2158  
 Epoch 47/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2119  
 Epoch 48/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2071  
 Epoch 49/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2033  
 Epoch 50/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2006  
 Epoch 1/50  
 504/504 [=====] - 5s 11ms/step - loss: 1.5091  
 Epoch 2/50  
 504/504 [=====] - 0s 124us/step - loss: 1.2902  
 Epoch 3/50  
 504/504 [=====] - 0s 124us/step - loss: 1.1476  
 Epoch 4/50  
 504/504 [=====] - 0s 155us/step - loss: 1.0439  
 Epoch 5/50  
 504/504 [=====] - 0s 155us/step - loss: 0.9598  
 Epoch 6/50  
 504/504 [=====] - 0s 124us/step - loss: 0.8953  
 Epoch 7/50  
 504/504 [=====] - 0s 124us/step - loss: 0.8352  
 Epoch 8/50  
 504/504 [=====] - 0s 124us/step - loss: 0.7787  
 Epoch 9/50  
 504/504 [=====] - 0s 124us/step - loss: 0.7302  
 Epoch 10/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6814  
 Epoch 11/50  
 504/504 [=====] - 0s 124us/step - loss: 0.6355  
 Epoch 12/50

504/504 [=====] - 0s 155us/step - loss: 0.5906  
Epoch 13/50  
504/504 [=====] - 0s 155us/step - loss: 0.5387  
Epoch 14/50  
504/504 [=====] - 0s 155us/step - loss: 0.4912  
Epoch 15/50  
504/504 [=====] - 0s 124us/step - loss: 0.4440  
Epoch 16/50  
504/504 [=====] - 0s 124us/step - loss: 0.4069  
Epoch 17/50  
504/504 [=====] - 0s 155us/step - loss: 0.3797  
Epoch 18/50  
504/504 [=====] - 0s 124us/step - loss: 0.3582  
Epoch 19/50  
504/504 [=====] - 0s 124us/step - loss: 0.3416  
Epoch 20/50  
504/504 [=====] - 0s 124us/step - loss: 0.3285  
Epoch 21/50  
504/504 [=====] - 0s 155us/step - loss: 0.3176  
Epoch 22/50  
504/504 [=====] - 0s 128us/step - loss: 0.3082  
Epoch 23/50  
504/504 [=====] - 0s 155us/step - loss: 0.3002  
Epoch 24/50  
504/504 [=====] - 0s 155us/step - loss: 0.2925  
Epoch 25/50  
504/504 [=====] - 0s 124us/step - loss: 0.2855  
Epoch 26/50  
504/504 [=====] - 0s 135us/step - loss: 0.2776  
Epoch 27/50  
504/504 [=====] - 0s 155us/step - loss: 0.2715  
Epoch 28/50  
504/504 [=====] - 0s 155us/step - loss: 0.2652  
Epoch 29/50  
504/504 [=====] - 0s 124us/step - loss: 0.2598  
Epoch 30/50  
504/504 [=====] - 0s 143us/step - loss: 0.2546  
Epoch 31/50  
504/504 [=====] - 0s 124us/step - loss: 0.2493  
Epoch 32/50  
504/504 [=====] - 0s 155us/step - loss: 0.2452  
Epoch 33/50  
504/504 [=====] - 0s 124us/step - loss: 0.2401  
Epoch 34/50  
504/504 [=====] - 0s 124us/step - loss: 0.2348  
Epoch 35/50  
504/504 [=====] - 0s 155us/step - loss: 0.2292  
Epoch 36/50



504/504 [=====] - 0s 155us/step - loss: 0.2241  
 Epoch 37/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2184  
 Epoch 38/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2129  
 Epoch 39/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2083  
 Epoch 40/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2043  
 Epoch 41/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1998  
 Epoch 42/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1947  
 Epoch 43/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1898  
 Epoch 44/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1867  
 Epoch 45/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1833  
 Epoch 46/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1794  
 Epoch 47/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1779  
 Epoch 48/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1737  
 Epoch 49/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1699  
 Epoch 50/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1677  
 Epoch 1/50  
 504/504 [=====] - 5s 11ms/step - loss: 1.0144  
 Epoch 2/50  
 504/504 [=====] - 0s 127us/step - loss: 0.9157  
 Epoch 3/50  
 504/504 [=====] - 0s 124us/step - loss: 0.8572  
 Epoch 4/50  
 504/504 [=====] - 0s 155us/step - loss: 0.8097  
 Epoch 5/50  
 504/504 [=====] - 0s 124us/step - loss: 0.7650  
 Epoch 6/50  
 504/504 [=====] - 0s 155us/step - loss: 0.7169  
 Epoch 7/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6721  
 Epoch 8/50  
 504/504 [=====] - 0s 124us/step - loss: 0.6332  
 Epoch 9/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5954  
 Epoch 10/50

504/504 [=====] - 0s 155us/step - loss: 0.5647  
 Epoch 11/50  
 504/504 [=====] - 0s 124us/step - loss: 0.5340  
 Epoch 12/50  
 504/504 [=====] - 0s 124us/step - loss: 0.5028  
 Epoch 13/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4733  
 Epoch 14/50  
 504/504 [=====] - 0s 124us/step - loss: 0.4431  
 Epoch 15/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4184  
 Epoch 16/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3950  
 Epoch 17/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3747  
 Epoch 18/50  
 504/504 [=====] - 0s 124us/step - loss: 0.3557  
 Epoch 19/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3411  
 Epoch 20/50  
 504/504 [=====] - 0s 124us/step - loss: 0.3244  
 Epoch 21/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3105  
 Epoch 22/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2980  
 Epoch 23/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2878  
 Epoch 24/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2780  
 Epoch 25/50  
 504/504 [=====] - 0s 142us/step - loss: 0.2678  
 Epoch 26/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2584  
 Epoch 27/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2508  
 Epoch 28/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2429  
 Epoch 29/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2375  
 Epoch 30/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2311  
 Epoch 31/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2244  
 Epoch 32/50  
 504/504 [=====] - 0s 157us/step - loss: 0.2201  
 Epoch 33/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2142  
 Epoch 34/50

504/504 [=====] - 0s 124us/step - loss: 0.2095  
 Epoch 35/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2066  
 Epoch 36/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2005  
 Epoch 37/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1978  
 Epoch 38/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1939  
 Epoch 39/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1915  
 Epoch 40/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1907  
 Epoch 41/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1853  
 Epoch 42/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1837  
 Epoch 43/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1811  
 Epoch 44/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1789  
 Epoch 45/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1778  
 Epoch 46/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1740  
 Epoch 47/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1727  
 Epoch 48/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1701  
 Epoch 49/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1669  
 Epoch 50/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1651  
 Epoch 1/50  
 504/504 [=====] - 5s 11ms/step - loss: 1.2086  
 Epoch 2/50  
 504/504 [=====] - 0s 124us/step - loss: 1.0351  
 Epoch 3/50  
 504/504 [=====] - 0s 140us/step - loss: 0.9246  
 Epoch 4/50  
 504/504 [=====] - 0s 155us/step - loss: 0.8435  
 Epoch 5/50  
 504/504 [=====] - 0s 155us/step - loss: 0.7855  
 Epoch 6/50  
 504/504 [=====] - 0s 124us/step - loss: 0.7326  
 Epoch 7/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6930  
 Epoch 8/50

504/504 [=====] - 0s 124us/step - loss: 0.6575  
Epoch 9/50  
504/504 [=====] - 0s 124us/step - loss: 0.6264  
Epoch 10/50  
504/504 [=====] - 0s 124us/step - loss: 0.5999  
Epoch 11/50  
504/504 [=====] - 0s 155us/step - loss: 0.5771  
Epoch 12/50  
504/504 [=====] - 0s 155us/step - loss: 0.5555  
Epoch 13/50  
504/504 [=====] - 0s 124us/step - loss: 0.5364  
Epoch 14/50  
504/504 [=====] - 0s 155us/step - loss: 0.5174  
Epoch 15/50  
504/504 [=====] - 0s 155us/step - loss: 0.5010  
Epoch 16/50  
504/504 [=====] - 0s 155us/step - loss: 0.4813  
Epoch 17/50  
504/504 [=====] - 0s 124us/step - loss: 0.4629  
Epoch 18/50  
504/504 [=====] - 0s 155us/step - loss: 0.4469  
Epoch 19/50  
504/504 [=====] - 0s 155us/step - loss: 0.4328  
Epoch 20/50  
504/504 [=====] - 0s 155us/step - loss: 0.4183  
Epoch 21/50  
504/504 [=====] - 0s 124us/step - loss: 0.4057  
Epoch 22/50  
504/504 [=====] - 0s 155us/step - loss: 0.3935  
Epoch 23/50  
504/504 [=====] - 0s 155us/step - loss: 0.3788  
Epoch 24/50  
504/504 [=====] - 0s 124us/step - loss: 0.3680  
Epoch 25/50  
504/504 [=====] - 0s 155us/step - loss: 0.3547  
Epoch 26/50  
504/504 [=====] - 0s 155us/step - loss: 0.3450  
Epoch 27/50  
504/504 [=====] - 0s 155us/step - loss: 0.3361  
Epoch 28/50  
504/504 [=====] - 0s 155us/step - loss: 0.3238  
Epoch 29/50  
504/504 [=====] - 0s 155us/step - loss: 0.3150  
Epoch 30/50  
504/504 [=====] - 0s 124us/step - loss: 0.3068  
Epoch 31/50  
504/504 [=====] - 0s 155us/step - loss: 0.2991  
Epoch 32/50

504/504 [=====] - 0s 155us/step - loss: 0.2924  
 Epoch 33/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2858  
 Epoch 34/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2806  
 Epoch 35/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2744  
 Epoch 36/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2680  
 Epoch 37/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2639  
 Epoch 38/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2579  
 Epoch 39/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2522  
 Epoch 40/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2474  
 Epoch 41/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2438  
 Epoch 42/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2411  
 Epoch 43/50  
 504/504 [=====] - 0s 156us/step - loss: 0.2365  
 Epoch 44/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2332  
 Epoch 45/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2311  
 Epoch 46/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2263  
 Epoch 47/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2236  
 Epoch 48/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2195  
 Epoch 49/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2170  
 Epoch 50/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2138  
 Epoch 1/50  
 504/504 [=====] - 6s 11ms/step - loss: 0.8739  
 Epoch 2/50  
 504/504 [=====] - 0s 124us/step - loss: 0.7016  
 Epoch 3/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6027  
 Epoch 4/50  
 504/504 [=====] - 0s 124us/step - loss: 0.5288  
 Epoch 5/50  
 504/504 [=====] - 0s 124us/step - loss: 0.4777  
 Epoch 6/50

504/504 [=====] - 0s 124us/step - loss: 0.4468  
Epoch 7/50  
504/504 [=====] - 0s 124us/step - loss: 0.4254  
Epoch 8/50  
504/504 [=====] - 0s 155us/step - loss: 0.4094  
Epoch 9/50  
504/504 [=====] - 0s 155us/step - loss: 0.3980  
Epoch 10/50  
504/504 [=====] - 0s 155us/step - loss: 0.3873  
Epoch 11/50  
504/504 [=====] - 0s 130us/step - loss: 0.3763  
Epoch 12/50  
504/504 [=====] - 0s 155us/step - loss: 0.3684  
Epoch 13/50  
504/504 [=====] - 0s 155us/step - loss: 0.3619  
Epoch 14/50  
504/504 [=====] - 0s 155us/step - loss: 0.3528  
Epoch 15/50  
504/504 [=====] - 0s 124us/step - loss: 0.3456  
Epoch 16/50  
504/504 [=====] - 0s 124us/step - loss: 0.3392  
Epoch 17/50  
504/504 [=====] - 0s 155us/step - loss: 0.3315  
Epoch 18/50  
504/504 [=====] - 0s 155us/step - loss: 0.3254  
Epoch 19/50  
504/504 [=====] - 0s 124us/step - loss: 0.3186  
Epoch 20/50  
504/504 [=====] - 0s 155us/step - loss: 0.3136  
Epoch 21/50  
504/504 [=====] - 0s 155us/step - loss: 0.3080  
Epoch 22/50  
504/504 [=====] - 0s 124us/step - loss: 0.3040  
Epoch 23/50  
504/504 [=====] - 0s 124us/step - loss: 0.2974  
Epoch 24/50  
504/504 [=====] - 0s 155us/step - loss: 0.2923  
Epoch 25/50  
504/504 [=====] - 0s 155us/step - loss: 0.2872  
Epoch 26/50  
504/504 [=====] - 0s 124us/step - loss: 0.2816  
Epoch 27/50  
504/504 [=====] - 0s 155us/step - loss: 0.2748  
Epoch 28/50  
504/504 [=====] - 0s 155us/step - loss: 0.2684  
Epoch 29/50  
504/504 [=====] - 0s 136us/step - loss: 0.2617  
Epoch 30/50

504/504 [=====] - 0s 155us/step - loss: 0.2559  
 Epoch 31/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2476  
 Epoch 32/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2378  
 Epoch 33/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2302  
 Epoch 34/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2227  
 Epoch 35/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2188  
 Epoch 36/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2100  
 Epoch 37/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2050  
 Epoch 38/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1997  
 Epoch 39/50  
 504/504 [=====] - 0s 186us/step - loss: 0.1953  
 Epoch 40/50  
 504/504 [=====] - 0s 217us/step - loss: 0.1923  
 Epoch 41/50  
 504/504 [=====] - 0s 217us/step - loss: 0.1884  
 Epoch 42/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1850  
 Epoch 43/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1816  
 Epoch 44/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1793  
 Epoch 45/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1762  
 Epoch 46/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1747  
 Epoch 47/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1721  
 Epoch 48/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1698  
 Epoch 49/50  
 504/504 [=====] - 0s 138us/step - loss: 0.1692  
 Epoch 50/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1663  
 Epoch 1/50  
 504/504 [=====] - 6s 11ms/step - loss: 0.9852  
 Epoch 2/50  
 504/504 [=====] - 0s 124us/step - loss: 0.8971  
 Epoch 3/50  
 504/504 [=====] - 0s 124us/step - loss: 0.8248  
 Epoch 4/50

504/504 [=====] - 0s 124us/step - loss: 0.7580  
Epoch 5/50  
504/504 [=====] - 0s 155us/step - loss: 0.6977  
Epoch 6/50  
504/504 [=====] - 0s 124us/step - loss: 0.6480  
Epoch 7/50  
504/504 [=====] - 0s 155us/step - loss: 0.5952  
Epoch 8/50  
504/504 [=====] - 0s 124us/step - loss: 0.5508  
Epoch 9/50  
504/504 [=====] - 0s 155us/step - loss: 0.5103  
Epoch 10/50  
504/504 [=====] - 0s 155us/step - loss: 0.4772  
Epoch 11/50  
504/504 [=====] - 0s 155us/step - loss: 0.4494  
Epoch 12/50  
504/504 [=====] - 0s 155us/step - loss: 0.4233  
Epoch 13/50  
504/504 [=====] - 0s 155us/step - loss: 0.4012  
Epoch 14/50  
504/504 [=====] - 0s 155us/step - loss: 0.3825  
Epoch 15/50  
504/504 [=====] - 0s 155us/step - loss: 0.3683  
Epoch 16/50  
504/504 [=====] - 0s 186us/step - loss: 0.3558  
Epoch 17/50  
504/504 [=====] - 0s 155us/step - loss: 0.3445  
Epoch 18/50  
504/504 [=====] - 0s 155us/step - loss: 0.3350  
Epoch 19/50  
504/504 [=====] - 0s 155us/step - loss: 0.3281  
Epoch 20/50  
504/504 [=====] - 0s 155us/step - loss: 0.3180  
Epoch 21/50  
504/504 [=====] - 0s 155us/step - loss: 0.3088  
Epoch 22/50  
504/504 [=====] - 0s 155us/step - loss: 0.3011  
Epoch 23/50  
504/504 [=====] - 0s 155us/step - loss: 0.2928  
Epoch 24/50  
504/504 [=====] - 0s 155us/step - loss: 0.2858  
Epoch 25/50  
504/504 [=====] - 0s 155us/step - loss: 0.2785  
Epoch 26/50  
504/504 [=====] - 0s 155us/step - loss: 0.2711  
Epoch 27/50  
504/504 [=====] - 0s 155us/step - loss: 0.2654  
Epoch 28/50



504/504 [=====] - 0s 155us/step - loss: 0.2604  
 Epoch 29/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2537  
 Epoch 30/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2506  
 Epoch 31/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2464  
 Epoch 32/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2397  
 Epoch 33/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2351  
 Epoch 34/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2322  
 Epoch 35/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2287  
 Epoch 36/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2237  
 Epoch 37/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2194  
 Epoch 38/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2155  
 Epoch 39/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2114  
 Epoch 40/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2086  
 Epoch 41/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2050  
 Epoch 42/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2019  
 Epoch 43/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1968  
 Epoch 44/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1950  
 Epoch 45/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1928  
 Epoch 46/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1891  
 Epoch 47/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1872  
 Epoch 48/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1841  
 Epoch 49/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1816  
 Epoch 50/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1805  
 Epoch 1/50  
 504/504 [=====] - 6s 11ms/step - loss: 0.9693  
 Epoch 2/50

504/504 [=====] - 0s 155us/step - loss: 0.9186  
 Epoch 3/50  
 504/504 [=====] - 0s 155us/step - loss: 0.8777  
 Epoch 4/50  
 504/504 [=====] - 0s 138us/step - loss: 0.8369  
 Epoch 5/50  
 504/504 [=====] - 0s 137us/step - loss: 0.7906  
 Epoch 6/50  
 504/504 [=====] - 0s 124us/step - loss: 0.7380  
 Epoch 7/50  
 504/504 [=====] - 0s 162us/step - loss: 0.6825  
 Epoch 8/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6210  
 Epoch 9/50  
 504/504 [=====] - 0s 124us/step - loss: 0.5555  
 Epoch 10/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4944  
 Epoch 11/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4465  
 Epoch 12/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4126  
 Epoch 13/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3918  
 Epoch 14/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3782  
 Epoch 15/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3681  
 Epoch 16/50  
 504/504 [=====] - 0s 124us/step - loss: 0.3594  
 Epoch 17/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3495  
 Epoch 18/50  
 504/504 [=====] - 0s 124us/step - loss: 0.3427  
 Epoch 19/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3342  
 Epoch 20/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3271  
 Epoch 21/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3233  
 Epoch 22/50  
 504/504 [=====] - 0s 124us/step - loss: 0.3170  
 Epoch 23/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3092  
 Epoch 24/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3037  
 Epoch 25/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2995  
 Epoch 26/50

504/504 [=====] - 0s 155us/step - loss: 0.2915  
 Epoch 27/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2877  
 Epoch 28/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2820  
 Epoch 29/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2768  
 Epoch 30/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2719  
 Epoch 31/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2674  
 Epoch 32/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2636  
 Epoch 33/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2588  
 Epoch 34/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2543  
 Epoch 35/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2505  
 Epoch 36/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2474  
 Epoch 37/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2431  
 Epoch 38/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2405  
 Epoch 39/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2365  
 Epoch 40/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2341  
 Epoch 41/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2303  
 Epoch 42/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2265  
 Epoch 43/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2225  
 Epoch 44/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2193  
 Epoch 45/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2136  
 Epoch 46/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2103  
 Epoch 47/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2049  
 Epoch 48/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2021  
 Epoch 49/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1984  
 Epoch 50/50

504/504 [=====] - 0s 155us/step - loss: 0.1955  
 Epoch 1/50  
 504/504 [=====] - 6s 11ms/step - loss: 0.9398  
 Epoch 2/50  
 504/504 [=====] - 0s 124us/step - loss: 0.8181  
 Epoch 3/50  
 504/504 [=====] - 0s 155us/step - loss: 0.7096  
 Epoch 4/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6229  
 Epoch 5/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5629  
 Epoch 6/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5207  
 Epoch 7/50  
 504/504 [=====] - 0s 124us/step - loss: 0.4870  
 Epoch 8/50  
 504/504 [=====] - 0s 124us/step - loss: 0.4618  
 Epoch 9/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4395  
 Epoch 10/50  
 504/504 [=====] - 0s 124us/step - loss: 0.4191  
 Epoch 11/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4000  
 Epoch 12/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3834  
 Epoch 13/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3695  
 Epoch 14/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3553  
 Epoch 15/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3427  
 Epoch 16/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3318  
 Epoch 17/50  
 504/504 [=====] - 0s 124us/step - loss: 0.3202  
 Epoch 18/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3098  
 Epoch 19/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3006  
 Epoch 20/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2939  
 Epoch 21/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2870  
 Epoch 22/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2793  
 Epoch 23/50  
 504/504 [=====] - 0s 135us/step - loss: 0.2740  
 Epoch 24/50

504/504 [=====] - 0s 155us/step - loss: 0.2672  
Epoch 25/50  
504/504 [=====] - 0s 124us/step - loss: 0.2628  
Epoch 26/50  
504/504 [=====] - 0s 155us/step - loss: 0.2544  
Epoch 27/50  
504/504 [=====] - 0s 155us/step - loss: 0.2491  
Epoch 28/50  
504/504 [=====] - 0s 155us/step - loss: 0.2452  
Epoch 29/50  
504/504 [=====] - 0s 124us/step - loss: 0.2389  
Epoch 30/50  
504/504 [=====] - 0s 155us/step - loss: 0.2348  
Epoch 31/50  
504/504 [=====] - 0s 124us/step - loss: 0.2296  
Epoch 32/50  
504/504 [=====] - 0s 155us/step - loss: 0.2256  
Epoch 33/50  
504/504 [=====] - 0s 155us/step - loss: 0.2223  
Epoch 34/50  
504/504 [=====] - 0s 124us/step - loss: 0.2204  
Epoch 35/50  
504/504 [=====] - 0s 124us/step - loss: 0.2153  
Epoch 36/50  
504/504 [=====] - 0s 155us/step - loss: 0.2108  
Epoch 37/50  
504/504 [=====] - 0s 155us/step - loss: 0.2075  
Epoch 38/50  
504/504 [=====] - 0s 155us/step - loss: 0.2051  
Epoch 39/50  
504/504 [=====] - 0s 124us/step - loss: 0.2023  
Epoch 40/50  
504/504 [=====] - 0s 155us/step - loss: 0.1996  
Epoch 41/50  
504/504 [=====] - 0s 155us/step - loss: 0.1975  
Epoch 42/50  
504/504 [=====] - 0s 155us/step - loss: 0.1949  
Epoch 43/50  
504/504 [=====] - 0s 124us/step - loss: 0.1937  
Epoch 44/50  
504/504 [=====] - 0s 155us/step - loss: 0.1892  
Epoch 45/50  
504/504 [=====] - 0s 155us/step - loss: 0.1878  
Epoch 46/50  
504/504 [=====] - 0s 155us/step - loss: 0.1870  
Epoch 47/50  
504/504 [=====] - 0s 155us/step - loss: 0.1843  
Epoch 48/50

504/504 [=====] - 0s 155us/step - loss: 0.1818  
 Epoch 49/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1806  
 Epoch 50/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1783  
 Epoch 1/50  
 504/504 [=====] - 6s 12ms/step - loss: 1.0220  
 Epoch 2/50  
 504/504 [=====] - 0s 155us/step - loss: 0.9511  
 Epoch 3/50  
 504/504 [=====] - 0s 124us/step - loss: 0.8994  
 Epoch 4/50  
 504/504 [=====] - 0s 186us/step - loss: 0.8567  
 Epoch 5/50  
 504/504 [=====] - 0s 155us/step - loss: 0.8228  
 Epoch 6/50  
 504/504 [=====] - 0s 124us/step - loss: 0.7894  
 Epoch 7/50  
 504/504 [=====] - 0s 155us/step - loss: 0.7601  
 Epoch 8/50  
 504/504 [=====] - 0s 155us/step - loss: 0.7281  
 Epoch 9/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6962  
 Epoch 10/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6583  
 Epoch 11/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6238  
 Epoch 12/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5926  
 Epoch 13/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5634  
 Epoch 14/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5367  
 Epoch 15/50  
 504/504 [=====] - 0s 124us/step - loss: 0.5127  
 Epoch 16/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4879  
 Epoch 17/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4634  
 Epoch 18/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4393  
 Epoch 19/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4198  
 Epoch 20/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3983  
 Epoch 21/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3788  
 Epoch 22/50

504/504 [=====] - 0s 155us/step - loss: 0.3614  
Epoch 23/50  
504/504 [=====] - 0s 155us/step - loss: 0.3471  
Epoch 24/50  
504/504 [=====] - 0s 155us/step - loss: 0.3319  
Epoch 25/50  
504/504 [=====] - 0s 155us/step - loss: 0.3181  
Epoch 26/50  
504/504 [=====] - 0s 155us/step - loss: 0.3055  
Epoch 27/50  
504/504 [=====] - 0s 155us/step - loss: 0.2924  
Epoch 28/50  
504/504 [=====] - 0s 155us/step - loss: 0.2818  
Epoch 29/50  
504/504 [=====] - 0s 124us/step - loss: 0.2709  
Epoch 30/50  
504/504 [=====] - 0s 155us/step - loss: 0.2636  
Epoch 31/50  
504/504 [=====] - 0s 155us/step - loss: 0.2546  
Epoch 32/50  
504/504 [=====] - 0s 124us/step - loss: 0.2476  
Epoch 33/50  
504/504 [=====] - 0s 186us/step - loss: 0.2401  
Epoch 34/50  
504/504 [=====] - 0s 155us/step - loss: 0.2343  
Epoch 35/50  
504/504 [=====] - 0s 124us/step - loss: 0.2275  
Epoch 36/50  
504/504 [=====] - 0s 155us/step - loss: 0.2200  
Epoch 37/50  
504/504 [=====] - 0s 155us/step - loss: 0.2162  
Epoch 38/50  
504/504 [=====] - 0s 155us/step - loss: 0.2107  
Epoch 39/50  
504/504 [=====] - 0s 155us/step - loss: 0.2077  
Epoch 40/50  
504/504 [=====] - 0s 155us/step - loss: 0.2010  
Epoch 41/50  
504/504 [=====] - 0s 155us/step - loss: 0.1981  
Epoch 42/50  
504/504 [=====] - 0s 155us/step - loss: 0.1942  
Epoch 43/50  
504/504 [=====] - 0s 124us/step - loss: 0.1906  
Epoch 44/50  
504/504 [=====] - 0s 155us/step - loss: 0.1871  
Epoch 45/50  
504/504 [=====] - 0s 155us/step - loss: 0.1859  
Epoch 46/50

504/504 [=====] - 0s 155us/step - loss: 0.1868  
 Epoch 47/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1804  
 Epoch 48/50  
 504/504 [=====] - 0s 159us/step - loss: 0.1793  
 Epoch 49/50  
 504/504 [=====] - 0s 125us/step - loss: 0.1750  
 Epoch 50/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1738  
 Epoch 1/50  
 504/504 [=====] - 6s 12ms/step - loss: 1.4996  
 Epoch 2/50  
 504/504 [=====] - 0s 155us/step - loss: 1.2184  
 Epoch 3/50  
 504/504 [=====] - 0s 186us/step - loss: 1.0779  
 Epoch 4/50  
 504/504 [=====] - 0s 155us/step - loss: 0.9912  
 Epoch 5/50  
 504/504 [=====] - 0s 155us/step - loss: 0.9253  
 Epoch 6/50  
 504/504 [=====] - 0s 124us/step - loss: 0.8742  
 Epoch 7/50  
 504/504 [=====] - 0s 155us/step - loss: 0.8255  
 Epoch 8/50  
 504/504 [=====] - 0s 155us/step - loss: 0.7743  
 Epoch 9/50  
 504/504 [=====] - 0s 155us/step - loss: 0.7222  
 Epoch 10/50  
 504/504 [=====] - 0s 186us/step - loss: 0.6670  
 Epoch 11/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6200  
 Epoch 12/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5762  
 Epoch 13/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5407  
 Epoch 14/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5095  
 Epoch 15/50  
 504/504 [=====] - 0s 186us/step - loss: 0.4811  
 Epoch 16/50  
 504/504 [=====] - 0s 155us/step - loss: 0.4562  
 Epoch 17/50  
 504/504 [=====] - 0s 186us/step - loss: 0.4322  
 Epoch 18/50  
 504/504 [=====] - 0s 217us/step - loss: 0.4117  
 Epoch 19/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3921  
 Epoch 20/50



504/504 [=====] - 0s 155us/step - loss: 0.3752  
Epoch 21/50  
504/504 [=====] - 0s 155us/step - loss: 0.3609  
Epoch 22/50  
504/504 [=====] - 0s 186us/step - loss: 0.3484  
Epoch 23/50  
504/504 [=====] - 0s 155us/step - loss: 0.3377  
Epoch 24/50  
504/504 [=====] - 0s 186us/step - loss: 0.3252  
Epoch 25/50  
504/504 [=====] - 0s 155us/step - loss: 0.3130  
Epoch 26/50  
504/504 [=====] - 0s 155us/step - loss: 0.3020  
Epoch 27/50  
504/504 [=====] - 0s 155us/step - loss: 0.2918  
Epoch 28/50  
504/504 [=====] - 0s 160us/step - loss: 0.2831  
Epoch 29/50  
504/504 [=====] - 0s 124us/step - loss: 0.2751  
Epoch 30/50  
504/504 [=====] - 0s 164us/step - loss: 0.2665  
Epoch 31/50  
504/504 [=====] - 0s 124us/step - loss: 0.2607  
Epoch 32/50  
504/504 [=====] - 0s 186us/step - loss: 0.2505  
Epoch 33/50  
504/504 [=====] - 0s 155us/step - loss: 0.2430  
Epoch 34/50  
504/504 [=====] - 0s 155us/step - loss: 0.2360  
Epoch 35/50  
504/504 [=====] - 0s 124us/step - loss: 0.2309  
Epoch 36/50  
504/504 [=====] - 0s 155us/step - loss: 0.2255  
Epoch 37/50  
504/504 [=====] - 0s 124us/step - loss: 0.2206  
Epoch 38/50  
504/504 [=====] - 0s 124us/step - loss: 0.2132  
Epoch 39/50  
504/504 [=====] - 0s 155us/step - loss: 0.2086  
Epoch 40/50  
504/504 [=====] - 0s 124us/step - loss: 0.2044  
Epoch 41/50  
504/504 [=====] - 0s 155us/step - loss: 0.2013  
Epoch 42/50  
504/504 [=====] - 0s 155us/step - loss: 0.1947  
Epoch 43/50  
504/504 [=====] - 0s 155us/step - loss: 0.1902  
Epoch 44/50

504/504 [=====] - 0s 155us/step - loss: 0.1854  
Epoch 45/50  
504/504 [=====] - 0s 186us/step - loss: 0.1799  
Epoch 46/50  
504/504 [=====] - 0s 155us/step - loss: 0.1738  
Epoch 47/50  
504/504 [=====] - 0s 155us/step - loss: 0.1669  
Epoch 48/50  
504/504 [=====] - 0s 155us/step - loss: 0.1635  
Epoch 49/50  
504/504 [=====] - 0s 124us/step - loss: 0.1595  
Epoch 50/50  
504/504 [=====] - 0s 155us/step - loss: 0.1556  
Epoch 1/50  
504/504 [=====] - 7s 15ms/step - loss: 1.2179  
Epoch 2/50  
504/504 [=====] - 0s 155us/step - loss: 1.0465  
Epoch 3/50  
504/504 [=====] - 0s 155us/step - loss: 0.9353  
Epoch 4/50  
504/504 [=====] - 0s 186us/step - loss: 0.8592  
Epoch 5/50  
504/504 [=====] - 0s 155us/step - loss: 0.7936  
Epoch 6/50  
504/504 [=====] - 0s 155us/step - loss: 0.7379  
Epoch 7/50  
504/504 [=====] - 0s 124us/step - loss: 0.6836  
Epoch 8/50  
504/504 [=====] - 0s 124us/step - loss: 0.6312  
Epoch 9/50  
504/504 [=====] - 0s 155us/step - loss: 0.5823  
Epoch 10/50  
504/504 [=====] - 0s 155us/step - loss: 0.5347  
Epoch 11/50  
504/504 [=====] - 0s 124us/step - loss: 0.4931  
Epoch 12/50  
504/504 [=====] - 0s 124us/step - loss: 0.4548  
Epoch 13/50  
504/504 [=====] - 0s 155us/step - loss: 0.4217  
Epoch 14/50  
504/504 [=====] - 0s 155us/step - loss: 0.3936  
Epoch 15/50  
504/504 [=====] - 0s 124us/step - loss: 0.3733  
Epoch 16/50  
504/504 [=====] - 0s 155us/step - loss: 0.3547  
Epoch 17/50  
504/504 [=====] - 0s 124us/step - loss: 0.3415  
Epoch 18/50

504/504 [=====] - 0s 124us/step - loss: 0.3316  
 Epoch 19/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3212  
 Epoch 20/50  
 504/504 [=====] - 0s 124us/step - loss: 0.3126  
 Epoch 21/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3059  
 Epoch 22/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2980  
 Epoch 23/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2922  
 Epoch 24/50  
 504/504 [=====] - 0s 143us/step - loss: 0.2862  
 Epoch 25/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2814  
 Epoch 26/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2782  
 Epoch 27/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2736  
 Epoch 28/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2701  
 Epoch 29/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2655  
 Epoch 30/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2626  
 Epoch 31/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2590  
 Epoch 32/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2551  
 Epoch 33/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2499  
 Epoch 34/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2462  
 Epoch 35/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2426  
 Epoch 36/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2380  
 Epoch 37/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2334  
 Epoch 38/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2279  
 Epoch 39/50  
 504/504 [=====] - 0s 372us/step - loss: 0.2244  
 Epoch 40/50  
 504/504 [=====] - 0s 341us/step - loss: 0.2216  
 Epoch 41/50  
 504/504 [=====] - 0s 310us/step - loss: 0.2170  
 Epoch 42/50

504/504 [=====] - 0s 155us/step - loss: 0.2125  
Epoch 43/50  
504/504 [=====] - 0s 155us/step - loss: 0.2090  
Epoch 44/50  
504/504 [=====] - 0s 217us/step - loss: 0.2040  
Epoch 45/50  
504/504 [=====] - 0s 155us/step - loss: 0.2003  
Epoch 46/50  
504/504 [=====] - 0s 155us/step - loss: 0.1966  
Epoch 47/50  
504/504 [=====] - 0s 217us/step - loss: 0.1932  
Epoch 48/50  
504/504 [=====] - 0s 186us/step - loss: 0.1904  
Epoch 49/50  
504/504 [=====] - 0s 217us/step - loss: 0.1862  
Epoch 50/50  
504/504 [=====] - 0s 186us/step - loss: 0.1826  
Epoch 1/50  
504/504 [=====] - 7s 13ms/step - loss: 1.3028  
Epoch 2/50  
504/504 [=====] - 0s 155us/step - loss: 1.0949  
Epoch 3/50  
504/504 [=====] - 0s 155us/step - loss: 0.9835  
Epoch 4/50  
504/504 [=====] - 0s 155us/step - loss: 0.9119  
Epoch 5/50  
504/504 [=====] - 0s 124us/step - loss: 0.8570  
Epoch 6/50  
504/504 [=====] - 0s 155us/step - loss: 0.8114  
Epoch 7/50  
504/504 [=====] - 0s 155us/step - loss: 0.7662  
Epoch 8/50  
504/504 [=====] - 0s 140us/step - loss: 0.7271  
Epoch 9/50  
504/504 [=====] - 0s 217us/step - loss: 0.6879  
Epoch 10/50  
504/504 [=====] - 0s 217us/step - loss: 0.6516  
Epoch 11/50  
504/504 [=====] - 0s 248us/step - loss: 0.6156  
Epoch 12/50  
504/504 [=====] - 0s 248us/step - loss: 0.5796  
Epoch 13/50  
504/504 [=====] - 0s 186us/step - loss: 0.5480  
Epoch 14/50  
504/504 [=====] - 0s 186us/step - loss: 0.5145  
Epoch 15/50  
504/504 [=====] - 0s 155us/step - loss: 0.4878  
Epoch 16/50

504/504 [=====] - 0s 162us/step - loss: 0.4632  
Epoch 17/50  
504/504 [=====] - 0s 126us/step - loss: 0.4428  
Epoch 18/50  
504/504 [=====] - 0s 155us/step - loss: 0.4256  
Epoch 19/50  
504/504 [=====] - 0s 124us/step - loss: 0.4096  
Epoch 20/50  
504/504 [=====] - 0s 155us/step - loss: 0.3956  
Epoch 21/50  
504/504 [=====] - 0s 124us/step - loss: 0.3837  
Epoch 22/50  
504/504 [=====] - 0s 155us/step - loss: 0.3698  
Epoch 23/50  
504/504 [=====] - 0s 130us/step - loss: 0.3627  
Epoch 24/50  
504/504 [=====] - 0s 124us/step - loss: 0.3485  
Epoch 25/50  
504/504 [=====] - 0s 155us/step - loss: 0.3405  
Epoch 26/50  
504/504 [=====] - 0s 124us/step - loss: 0.3314  
Epoch 27/50  
504/504 [=====] - 0s 135us/step - loss: 0.3212  
Epoch 28/50  
504/504 [=====] - 0s 124us/step - loss: 0.3118  
Epoch 29/50  
504/504 [=====] - 0s 124us/step - loss: 0.3027  
Epoch 30/50  
504/504 [=====] - 0s 124us/step - loss: 0.2949  
Epoch 31/50  
504/504 [=====] - 0s 124us/step - loss: 0.2903  
Epoch 32/50  
504/504 [=====] - 0s 155us/step - loss: 0.2818  
Epoch 33/50  
504/504 [=====] - 0s 124us/step - loss: 0.2729  
Epoch 34/50  
504/504 [=====] - 0s 124us/step - loss: 0.2667  
Epoch 35/50  
504/504 [=====] - 0s 124us/step - loss: 0.2581  
Epoch 36/50  
504/504 [=====] - 0s 124us/step - loss: 0.2503  
Epoch 37/50  
504/504 [=====] - 0s 124us/step - loss: 0.2459  
Epoch 38/50  
504/504 [=====] - 0s 124us/step - loss: 0.2393  
Epoch 39/50  
504/504 [=====] - 0s 124us/step - loss: 0.2335  
Epoch 40/50

504/504 [=====] - 0s 124us/step - loss: 0.2293  
 Epoch 41/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2247  
 Epoch 42/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2200  
 Epoch 43/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2174  
 Epoch 44/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2121  
 Epoch 45/50  
 504/504 [=====] - 0s 137us/step - loss: 0.2088  
 Epoch 46/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2057  
 Epoch 47/50  
 504/504 [=====] - 0s 144us/step - loss: 0.2025  
 Epoch 48/50  
 504/504 [=====] - 0s 130us/step - loss: 0.1991  
 Epoch 49/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1965  
 Epoch 50/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1951  
 Epoch 1/50  
 504/504 [=====] - 6s 12ms/step - loss: 1.1082  
 Epoch 2/50  
 504/504 [=====] - 0s 155us/step - loss: 1.0323  
 Epoch 3/50  
 504/504 [=====] - 0s 124us/step - loss: 0.9827  
 Epoch 4/50  
 504/504 [=====] - 0s 155us/step - loss: 0.9472  
 Epoch 5/50  
 504/504 [=====] - 0s 145us/step - loss: 0.9167  
 Epoch 6/50  
 504/504 [=====] - 0s 155us/step - loss: 0.8842  
 Epoch 7/50  
 504/504 [=====] - 0s 279us/step - loss: 0.8457  
 Epoch 8/50  
 504/504 [=====] - 0s 186us/step - loss: 0.7896  
 Epoch 9/50  
 504/504 [=====] - 0s 155us/step - loss: 0.7221  
 Epoch 10/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6438  
 Epoch 11/50  
 504/504 [=====] - 0s 186us/step - loss: 0.5620  
 Epoch 12/50  
 504/504 [=====] - 0s 186us/step - loss: 0.4794  
 Epoch 13/50  
 504/504 [=====] - 0s 310us/step - loss: 0.4219  
 Epoch 14/50

504/504 [=====] - 0s 217us/step - loss: 0.3916  
 Epoch 15/50  
 504/504 [=====] - 0s 186us/step - loss: 0.3717  
 Epoch 16/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3582  
 Epoch 17/50  
 504/504 [=====] - 0s 155us/step - loss: 0.3448  
 Epoch 18/50  
 504/504 [=====] - 0s 186us/step - loss: 0.3342  
 Epoch 19/50  
 504/504 [=====] - 0s 186us/step - loss: 0.3228  
 Epoch 20/50  
 504/504 [=====] - 0s 186us/step - loss: 0.3139  
 Epoch 21/50  
 504/504 [=====] - 0s 186us/step - loss: 0.3030  
 Epoch 22/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2960  
 Epoch 23/50  
 504/504 [=====] - 0s 217us/step - loss: 0.2885  
 Epoch 24/50  
 504/504 [=====] - 0s 217us/step - loss: 0.2818  
 Epoch 25/50  
 504/504 [=====] - 0s 217us/step - loss: 0.2755  
 Epoch 26/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2693  
 Epoch 27/50  
 504/504 [=====] - 0s 217us/step - loss: 0.2630  
 Epoch 28/50  
 504/504 [=====] - 0s 248us/step - loss: 0.2588  
 Epoch 29/50  
 504/504 [=====] - 0s 217us/step - loss: 0.2551  
 Epoch 30/50  
 504/504 [=====] - 0s 248us/step - loss: 0.2474  
 Epoch 31/50  
 504/504 [=====] - 0s 248us/step - loss: 0.2430  
 Epoch 32/50  
 504/504 [=====] - 0s 217us/step - loss: 0.2384  
 Epoch 33/50  
 504/504 [=====] - 0s 217us/step - loss: 0.2332  
 Epoch 34/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2294  
 Epoch 35/50  
 504/504 [=====] - 0s 217us/step - loss: 0.2249  
 Epoch 36/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2221  
 Epoch 37/50  
 504/504 [=====] - 0s 196us/step - loss: 0.2172  
 Epoch 38/50

504/504 [=====] - 0s 124us/step - loss: 0.2135  
 Epoch 39/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2122  
 Epoch 40/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2087  
 Epoch 41/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2056  
 Epoch 42/50  
 504/504 [=====] - 0s 124us/step - loss: 0.2024  
 Epoch 43/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1996  
 Epoch 44/50  
 504/504 [=====] - 0s 217us/step - loss: 0.1964  
 Epoch 45/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1945  
 Epoch 46/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1922  
 Epoch 47/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1912  
 Epoch 48/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1877  
 Epoch 49/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1870  
 Epoch 50/50  
 504/504 [=====] - 0s 124us/step - loss: 0.1859  
 Epoch 1/50  
 504/504 [=====] - 8s 15ms/step - loss: 1.4958  
 Epoch 2/50  
 504/504 [=====] - 0s 217us/step - loss: 1.1909  
 Epoch 3/50  
 504/504 [=====] - 0s 186us/step - loss: 0.9995  
 Epoch 4/50  
 504/504 [=====] - 0s 186us/step - loss: 0.8749  
 Epoch 5/50  
 504/504 [=====] - 0s 155us/step - loss: 0.7939  
 Epoch 6/50  
 504/504 [=====] - 0s 186us/step - loss: 0.7265  
 Epoch 7/50  
 504/504 [=====] - 0s 186us/step - loss: 0.6774  
 Epoch 8/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6379  
 Epoch 9/50  
 504/504 [=====] - 0s 186us/step - loss: 0.6055  
 Epoch 10/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5774  
 Epoch 11/50  
 504/504 [=====] - 0s 217us/step - loss: 0.5551  
 Epoch 12/50



504/504 [=====] - 0s 280us/step - loss: 0.5349  
Epoch 13/50  
504/504 [=====] - 0s 279us/step - loss: 0.5159  
Epoch 14/50  
504/504 [=====] - 0s 155us/step - loss: 0.4974  
Epoch 15/50  
504/504 [=====] - 0s 155us/step - loss: 0.4817  
Epoch 16/50  
504/504 [=====] - 0s 155us/step - loss: 0.4661  
Epoch 17/50  
504/504 [=====] - 0s 186us/step - loss: 0.4508  
Epoch 18/50  
504/504 [=====] - 0s 155us/step - loss: 0.4361  
Epoch 19/50  
504/504 [=====] - 0s 186us/step - loss: 0.4228  
Epoch 20/50  
504/504 [=====] - 0s 186us/step - loss: 0.4112  
Epoch 21/50  
504/504 [=====] - 0s 155us/step - loss: 0.3977  
Epoch 22/50  
504/504 [=====] - 0s 155us/step - loss: 0.3860  
Epoch 23/50  
504/504 [=====] - 0s 155us/step - loss: 0.3758  
Epoch 24/50  
504/504 [=====] - 0s 186us/step - loss: 0.3671  
Epoch 25/50  
504/504 [=====] - 0s 155us/step - loss: 0.3585  
Epoch 26/50  
504/504 [=====] - 0s 217us/step - loss: 0.3512  
Epoch 27/50  
504/504 [=====] - 0s 186us/step - loss: 0.3444  
Epoch 28/50  
504/504 [=====] - 0s 248us/step - loss: 0.3386  
Epoch 29/50  
504/504 [=====] - 0s 248us/step - loss: 0.3325  
Epoch 30/50  
504/504 [=====] - 0s 279us/step - loss: 0.3252  
Epoch 31/50  
504/504 [=====] - 0s 186us/step - loss: 0.3194  
Epoch 32/50  
504/504 [=====] - 0s 186us/step - loss: 0.3131  
Epoch 33/50  
504/504 [=====] - 0s 186us/step - loss: 0.3084  
Epoch 34/50  
504/504 [=====] - 0s 155us/step - loss: 0.3022  
Epoch 35/50  
504/504 [=====] - 0s 155us/step - loss: 0.2965  
Epoch 36/50

504/504 [=====] - 0s 155us/step - loss: 0.2910  
Epoch 37/50  
504/504 [=====] - 0s 186us/step - loss: 0.2866  
Epoch 38/50  
504/504 [=====] - 0s 186us/step - loss: 0.2794  
Epoch 39/50  
504/504 [=====] - 0s 186us/step - loss: 0.2740  
Epoch 40/50  
504/504 [=====] - 0s 155us/step - loss: 0.2680  
Epoch 41/50  
504/504 [=====] - 0s 186us/step - loss: 0.2627  
Epoch 42/50  
504/504 [=====] - 0s 124us/step - loss: 0.2567  
Epoch 43/50  
504/504 [=====] - 0s 186us/step - loss: 0.2515  
Epoch 44/50  
504/504 [=====] - 0s 186us/step - loss: 0.2467  
Epoch 45/50  
504/504 [=====] - 0s 155us/step - loss: 0.2429  
Epoch 46/50  
504/504 [=====] - 0s 186us/step - loss: 0.2370  
Epoch 47/50  
504/504 [=====] - 0s 186us/step - loss: 0.2326  
Epoch 48/50  
504/504 [=====] - 0s 155us/step - loss: 0.2269  
Epoch 49/50  
504/504 [=====] - 0s 186us/step - loss: 0.2227  
Epoch 50/50  
504/504 [=====] - 0s 186us/step - loss: 0.2174  
Epoch 1/50  
504/504 [=====] - 9s 18ms/step - loss: 1.0339  
Epoch 2/50  
504/504 [=====] - 0s 186us/step - loss: 0.9516  
Epoch 3/50  
504/504 [=====] - 0s 186us/step - loss: 0.8920  
Epoch 4/50  
504/504 [=====] - 0s 155us/step - loss: 0.8428  
Epoch 5/50  
504/504 [=====] - 0s 186us/step - loss: 0.7884  
Epoch 6/50  
504/504 [=====] - 0s 155us/step - loss: 0.7327  
Epoch 7/50  
504/504 [=====] - 0s 155us/step - loss: 0.6730  
Epoch 8/50  
504/504 [=====] - 0s 186us/step - loss: 0.6094  
Epoch 9/50  
504/504 [=====] - 0s 155us/step - loss: 0.5576  
Epoch 10/50

504/504 [=====] - 0s 155us/step - loss: 0.5113  
Epoch 11/50  
504/504 [=====] - 0s 186us/step - loss: 0.4700  
Epoch 12/50  
504/504 [=====] - 0s 155us/step - loss: 0.4394  
Epoch 13/50  
504/504 [=====] - 0s 155us/step - loss: 0.4129  
Epoch 14/50  
504/504 [=====] - 0s 186us/step - loss: 0.3930  
Epoch 15/50  
504/504 [=====] - 0s 155us/step - loss: 0.3757  
Epoch 16/50  
504/504 [=====] - 0s 186us/step - loss: 0.3627  
Epoch 17/50  
504/504 [=====] - 0s 186us/step - loss: 0.3468  
Epoch 18/50  
504/504 [=====] - 0s 155us/step - loss: 0.3333  
Epoch 19/50  
504/504 [=====] - 0s 155us/step - loss: 0.3208  
Epoch 20/50  
504/504 [=====] - 0s 155us/step - loss: 0.3093  
Epoch 21/50  
504/504 [=====] - 0s 186us/step - loss: 0.2958  
Epoch 22/50  
504/504 [=====] - 0s 310us/step - loss: 0.2816  
Epoch 23/50  
504/504 [=====] - 0s 217us/step - loss: 0.2699  
Epoch 24/50  
504/504 [=====] - 0s 251us/step - loss: 0.2587  
Epoch 25/50  
504/504 [=====] - 0s 189us/step - loss: 0.2493  
Epoch 26/50  
504/504 [=====] - 0s 190us/step - loss: 0.2409  
Epoch 27/50  
504/504 [=====] - 0s 177us/step - loss: 0.2340  
Epoch 28/50  
504/504 [=====] - 0s 178us/step - loss: 0.2260  
Epoch 29/50  
504/504 [=====] - 0s 189us/step - loss: 0.2199  
Epoch 30/50  
504/504 [=====] - 0s 209us/step - loss: 0.2197  
Epoch 31/50  
504/504 [=====] - 0s 218us/step - loss: 0.2153  
Epoch 32/50  
504/504 [=====] - 0s 208us/step - loss: 0.2067  
Epoch 33/50  
504/504 [=====] - 0s 219us/step - loss: 0.2007  
Epoch 34/50

504/504 [=====] - 0s 218us/step - loss: 0.2002  
 Epoch 35/50  
 504/504 [=====] - 0s 238us/step - loss: 0.1965  
 Epoch 36/50  
 504/504 [=====] - 0s 258us/step - loss: 0.1911  
 Epoch 37/50  
 504/504 [=====] - 0s 223us/step - loss: 0.1876  
 Epoch 38/50  
 504/504 [=====] - 0s 185us/step - loss: 0.1859  
 Epoch 39/50  
 504/504 [=====] - 0s 199us/step - loss: 0.1815  
 Epoch 40/50  
 504/504 [=====] - 0s 274us/step - loss: 0.1789  
 Epoch 41/50  
 504/504 [=====] - 0s 238us/step - loss: 0.1761  
 Epoch 42/50  
 504/504 [=====] - 0s 186us/step - loss: 0.1741  
 Epoch 43/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1724  
 Epoch 44/50  
 504/504 [=====] - 0s 217us/step - loss: 0.1699  
 Epoch 45/50  
 504/504 [=====] - 0s 248us/step - loss: 0.1671  
 Epoch 46/50  
 504/504 [=====] - 0s 341us/step - loss: 0.1659  
 Epoch 47/50  
 504/504 [=====] - 0s 279us/step - loss: 0.1647  
 Epoch 48/50  
 504/504 [=====] - 0s 217us/step - loss: 0.1637  
 Epoch 49/50  
 504/504 [=====] - 0s 279us/step - loss: 0.1613  
 Epoch 50/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1599  
 Epoch 1/50  
 504/504 [=====] - 9s 17ms/step - loss: 1.5183  
 Epoch 2/50  
 504/504 [=====] - 0s 248us/step - loss: 1.1717  
 Epoch 3/50  
 504/504 [=====] - 0s 217us/step - loss: 1.0123  
 Epoch 4/50  
 504/504 [=====] - 0s 253us/step - loss: 0.9288  
 Epoch 5/50  
 504/504 [=====] - 0s 209us/step - loss: 0.8793  
 Epoch 6/50  
 504/504 [=====] - 0s 199us/step - loss: 0.8365  
 Epoch 7/50  
 504/504 [=====] - 0s 218us/step - loss: 0.7967  
 Epoch 8/50

504/504 [=====] - 0s 209us/step - loss: 0.7589  
 Epoch 9/50  
 504/504 [=====] - 0s 228us/step - loss: 0.7219  
 Epoch 10/50  
 504/504 [=====] - 0s 258us/step - loss: 0.6866  
 Epoch 11/50  
 504/504 [=====] - 0s 199us/step - loss: 0.6497  
 Epoch 12/50  
 504/504 [=====] - 0s 198us/step - loss: 0.6160  
 Epoch 13/50  
 504/504 [=====] - 0s 209us/step - loss: 0.5844  
 Epoch 14/50  
 504/504 [=====] - 0s 212us/step - loss: 0.5529  
 Epoch 15/50  
 504/504 [=====] - 0s 224us/step - loss: 0.5227  
 Epoch 16/50  
 504/504 [=====] - 0s 219us/step - loss: 0.5011  
 Epoch 17/50  
 504/504 [=====] - 0s 168us/step - loss: 0.4794  
 Epoch 18/50  
 504/504 [=====] - 0s 208us/step - loss: 0.4622  
 Epoch 19/50  
 504/504 [=====] - 0s 198us/step - loss: 0.4476  
 Epoch 20/50  
 504/504 [=====] - 0s 179us/step - loss: 0.4344  
 Epoch 21/50  
 504/504 [=====] - 0s 164us/step - loss: 0.4243  
 Epoch 22/50  
 504/504 [=====] - 0s 184us/step - loss: 0.4140  
 Epoch 23/50  
 504/504 [=====] - 0s 183us/step - loss: 0.4052  
 Epoch 24/50  
 504/504 [=====] - 0s 189us/step - loss: 0.3954  
 Epoch 25/50  
 504/504 [=====] - 0s 178us/step - loss: 0.3882  
 Epoch 26/50  
 504/504 [=====] - 0s 179us/step - loss: 0.3806  
 Epoch 27/50  
 504/504 [=====] - 0s 189us/step - loss: 0.3745  
 Epoch 28/50  
 504/504 [=====] - 0s 189us/step - loss: 0.3685  
 Epoch 29/50  
 504/504 [=====] - 0s 208us/step - loss: 0.3613  
 Epoch 30/50  
 504/504 [=====] - 0s 208us/step - loss: 0.3552  
 Epoch 31/50  
 504/504 [=====] - 0s 188us/step - loss: 0.3489  
 Epoch 32/50

504/504 [=====] - 0s 169us/step - loss: 0.3425  
 Epoch 33/50  
 504/504 [=====] - 0s 228us/step - loss: 0.3364  
 Epoch 34/50  
 504/504 [=====] - 0s 218us/step - loss: 0.3298  
 Epoch 35/50  
 504/504 [=====] - 0s 198us/step - loss: 0.3258  
 Epoch 36/50  
 504/504 [=====] - 0s 199us/step - loss: 0.3188  
 Epoch 37/50  
 504/504 [=====] - 0s 199us/step - loss: 0.3139  
 Epoch 38/50  
 504/504 [=====] - 0s 189us/step - loss: 0.3069  
 Epoch 39/50  
 504/504 [=====] - 0s 198us/step - loss: 0.3019  
 Epoch 40/50  
 504/504 [=====] - 0s 179us/step - loss: 0.2960  
 Epoch 41/50  
 504/504 [=====] - 0s 209us/step - loss: 0.2913  
 Epoch 42/50  
 504/504 [=====] - 0s 198us/step - loss: 0.2858  
 Epoch 43/50  
 504/504 [=====] - 0s 199us/step - loss: 0.2806  
 Epoch 44/50  
 504/504 [=====] - 0s 179us/step - loss: 0.2766  
 Epoch 45/50  
 504/504 [=====] - 0s 179us/step - loss: 0.2716  
 Epoch 46/50  
 504/504 [=====] - 0s 189us/step - loss: 0.2667  
 Epoch 47/50  
 504/504 [=====] - 0s 178us/step - loss: 0.2638  
 Epoch 48/50  
 504/504 [=====] - 0s 179us/step - loss: 0.2606  
 Epoch 49/50  
 504/504 [=====] - 0s 179us/step - loss: 0.2567  
 Epoch 50/50  
 504/504 [=====] - 0s 178us/step - loss: 0.2507  
 Epoch 1/50  
 504/504 [=====] - 8s 16ms/step - loss: 0.9306  
 Epoch 2/50  
 504/504 [=====] - 0s 155us/step - loss: 0.8526  
 Epoch 3/50  
 504/504 [=====] - 0s 186us/step - loss: 0.7716  
 Epoch 4/50  
 504/504 [=====] - 0s 341us/step - loss: 0.7037  
 Epoch 5/50  
 504/504 [=====] - 0s 238us/step - loss: 0.6338  
 Epoch 6/50

504/504 [=====] - 0s 188us/step - loss: 0.5744  
Epoch 7/50  
504/504 [=====] - 0s 199us/step - loss: 0.5178  
Epoch 8/50  
504/504 [=====] - 0s 199us/step - loss: 0.4726  
Epoch 9/50  
504/504 [=====] - 0s 178us/step - loss: 0.4371  
Epoch 10/50  
504/504 [=====] - 0s 198us/step - loss: 0.4076  
Epoch 11/50  
504/504 [=====] - 0s 189us/step - loss: 0.3859  
Epoch 12/50  
504/504 [=====] - 0s 228us/step - loss: 0.3666  
Epoch 13/50  
504/504 [=====] - 0s 179us/step - loss: 0.3510  
Epoch 14/50  
504/504 [=====] - 0s 189us/step - loss: 0.3344  
Epoch 15/50  
504/504 [=====] - 0s 189us/step - loss: 0.3210  
Epoch 16/50  
504/504 [=====] - 0s 169us/step - loss: 0.3067  
Epoch 17/50  
504/504 [=====] - 0s 218us/step - loss: 0.2940  
Epoch 18/50  
504/504 [=====] - 0s 179us/step - loss: 0.2838  
Epoch 19/50  
504/504 [=====] - 0s 229us/step - loss: 0.2746  
Epoch 20/50  
504/504 [=====] - 0s 179us/step - loss: 0.2666  
Epoch 21/50  
504/504 [=====] - 0s 178us/step - loss: 0.2590  
Epoch 22/50  
504/504 [=====] - 0s 208us/step - loss: 0.2536  
Epoch 23/50  
504/504 [=====] - 0s 228us/step - loss: 0.2493  
Epoch 24/50  
504/504 [=====] - 0s 219us/step - loss: 0.2432  
Epoch 25/50  
504/504 [=====] - 0s 198us/step - loss: 0.2391  
Epoch 26/50  
504/504 [=====] - 0s 189us/step - loss: 0.2318  
Epoch 27/50  
504/504 [=====] - 0s 179us/step - loss: 0.2282  
Epoch 28/50  
504/504 [=====] - 0s 178us/step - loss: 0.2223  
Epoch 29/50  
504/504 [=====] - 0s 178us/step - loss: 0.2187  
Epoch 30/50

504/504 [=====] - 0s 179us/step - loss: 0.2129  
 Epoch 31/50  
 504/504 [=====] - 0s 179us/step - loss: 0.2087  
 Epoch 32/50  
 504/504 [=====] - 0s 188us/step - loss: 0.2060  
 Epoch 33/50  
 504/504 [=====] - 0s 198us/step - loss: 0.2049  
 Epoch 34/50  
 504/504 [=====] - 0s 198us/step - loss: 0.1963  
 Epoch 35/50  
 504/504 [=====] - 0s 199us/step - loss: 0.1937  
 Epoch 36/50  
 504/504 [=====] - 0s 189us/step - loss: 0.1901  
 Epoch 37/50  
 504/504 [=====] - 0s 179us/step - loss: 0.1866  
 Epoch 38/50  
 504/504 [=====] - 0s 179us/step - loss: 0.1831  
 Epoch 39/50  
 504/504 [=====] - 0s 189us/step - loss: 0.1798  
 Epoch 40/50  
 504/504 [=====] - 0s 218us/step - loss: 0.1770  
 Epoch 41/50  
 504/504 [=====] - 0s 218us/step - loss: 0.1732  
 Epoch 42/50  
 504/504 [=====] - 0s 219us/step - loss: 0.1697  
 Epoch 43/50  
 504/504 [=====] - 0s 188us/step - loss: 0.1657  
 Epoch 44/50  
 504/504 [=====] - 0s 180us/step - loss: 0.1643  
 Epoch 45/50  
 504/504 [=====] - 0s 178us/step - loss: 0.1612  
 Epoch 46/50  
 504/504 [=====] - 0s 198us/step - loss: 0.1576  
 Epoch 47/50  
 504/504 [=====] - 0s 179us/step - loss: 0.1546  
 Epoch 48/50  
 504/504 [=====] - 0s 189us/step - loss: 0.1509  
 Epoch 49/50  
 504/504 [=====] - 0s 189us/step - loss: 0.1492  
 Epoch 50/50  
 504/504 [=====] - 0s 188us/step - loss: 0.1466  
 Epoch 1/50  
 504/504 [=====] - 8s 16ms/step - loss: 1.0293  
 Epoch 2/50  
 504/504 [=====] - 0s 179us/step - loss: 0.9603  
 Epoch 3/50  
 504/504 [=====] - 0s 188us/step - loss: 0.9126  
 Epoch 4/50



504/504 [=====] - 0s 219us/step - loss: 0.8671  
Epoch 5/50  
504/504 [=====] - 0s 179us/step - loss: 0.8197  
Epoch 6/50  
504/504 [=====] - 0s 199us/step - loss: 0.7684  
Epoch 7/50  
504/504 [=====] - 0s 197us/step - loss: 0.7117  
Epoch 8/50  
504/504 [=====] - 0s 199us/step - loss: 0.6544  
Epoch 9/50  
504/504 [=====] - 0s 258us/step - loss: 0.6006  
Epoch 10/50  
504/504 [=====] - 0s 189us/step - loss: 0.5618  
Epoch 11/50  
504/504 [=====] - 0s 172us/step - loss: 0.5245  
Epoch 12/50  
504/504 [=====] - 0s 186us/step - loss: 0.4989  
Epoch 13/50  
504/504 [=====] - 0s 155us/step - loss: 0.4785  
Epoch 14/50  
504/504 [=====] - 0s 186us/step - loss: 0.4631  
Epoch 15/50  
504/504 [=====] - 0s 155us/step - loss: 0.4479  
Epoch 16/50  
504/504 [=====] - 0s 155us/step - loss: 0.4359  
Epoch 17/50  
504/504 [=====] - 0s 186us/step - loss: 0.4218  
Epoch 18/50  
504/504 [=====] - 0s 155us/step - loss: 0.4081  
Epoch 19/50  
504/504 [=====] - 0s 155us/step - loss: 0.3964  
Epoch 20/50  
504/504 [=====] - 0s 186us/step - loss: 0.3845  
Epoch 21/50  
504/504 [=====] - 0s 186us/step - loss: 0.3701  
Epoch 22/50  
504/504 [=====] - 0s 155us/step - loss: 0.3578  
Epoch 23/50  
504/504 [=====] - 0s 186us/step - loss: 0.3453  
Epoch 24/50  
504/504 [=====] - 0s 155us/step - loss: 0.3339  
Epoch 25/50  
504/504 [=====] - 0s 155us/step - loss: 0.3230  
Epoch 26/50  
504/504 [=====] - 0s 186us/step - loss: 0.3110  
Epoch 27/50  
504/504 [=====] - 0s 186us/step - loss: 0.3006  
Epoch 28/50

504/504 [=====] - 0s 186us/step - loss: 0.2878  
 Epoch 29/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2765  
 Epoch 30/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2669  
 Epoch 31/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2579  
 Epoch 32/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2489  
 Epoch 33/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2413  
 Epoch 34/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2338  
 Epoch 35/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2274  
 Epoch 36/50  
 504/504 [=====] - 0s 341us/step - loss: 0.2216  
 Epoch 37/50  
 504/504 [=====] - 0s 215us/step - loss: 0.2163  
 Epoch 38/50  
 504/504 [=====] - 0s 199us/step - loss: 0.2126  
 Epoch 39/50  
 504/504 [=====] - 0s 199us/step - loss: 0.2073  
 Epoch 40/50  
 504/504 [=====] - 0s 178us/step - loss: 0.2032  
 Epoch 41/50  
 504/504 [=====] - 0s 199us/step - loss: 0.2006  
 Epoch 42/50  
 504/504 [=====] - 0s 218us/step - loss: 0.1960  
 Epoch 43/50  
 504/504 [=====] - 0s 218us/step - loss: 0.1957  
 Epoch 44/50  
 504/504 [=====] - 0s 238us/step - loss: 0.1896  
 Epoch 45/50  
 504/504 [=====] - 0s 179us/step - loss: 0.1869  
 Epoch 46/50  
 504/504 [=====] - 0s 179us/step - loss: 0.1854  
 Epoch 47/50  
 504/504 [=====] - 0s 188us/step - loss: 0.1824  
 Epoch 48/50  
 504/504 [=====] - 0s 199us/step - loss: 0.1798  
 Epoch 49/50  
 504/504 [=====] - 0s 248us/step - loss: 0.1789  
 Epoch 50/50  
 504/504 [=====] - 0s 189us/step - loss: 0.1751  
 Epoch 1/50  
 504/504 [=====] - 8s 17ms/step - loss: 1.0333  
 Epoch 2/50

504/504 [=====] - 0s 186us/step - loss: 0.9736  
Epoch 3/50  
504/504 [=====] - 0s 155us/step - loss: 0.9272  
Epoch 4/50  
504/504 [=====] - 0s 155us/step - loss: 0.8865  
Epoch 5/50  
504/504 [=====] - 0s 186us/step - loss: 0.8395  
Epoch 6/50  
504/504 [=====] - 0s 186us/step - loss: 0.7851  
Epoch 7/50  
504/504 [=====] - 0s 279us/step - loss: 0.7243  
Epoch 8/50  
504/504 [=====] - 0s 279us/step - loss: 0.6582  
Epoch 9/50  
504/504 [=====] - 0s 234us/step - loss: 0.5888  
Epoch 10/50  
504/504 [=====] - 0s 199us/step - loss: 0.5300  
Epoch 11/50  
504/504 [=====] - 0s 199us/step - loss: 0.4703  
Epoch 12/50  
504/504 [=====] - 0s 208us/step - loss: 0.4253  
Epoch 13/50  
504/504 [=====] - 0s 249us/step - loss: 0.3895  
Epoch 14/50  
504/504 [=====] - 0s 218us/step - loss: 0.3604  
Epoch 15/50  
504/504 [=====] - 0s 212us/step - loss: 0.3413  
Epoch 16/50  
504/504 [=====] - 0s 215us/step - loss: 0.3188  
Epoch 17/50  
504/504 [=====] - 0s 259us/step - loss: 0.3017  
Epoch 18/50  
504/504 [=====] - 0s 248us/step - loss: 0.2880  
Epoch 19/50  
504/504 [=====] - 0s 238us/step - loss: 0.2755  
Epoch 20/50  
504/504 [=====] - 0s 209us/step - loss: 0.2638  
Epoch 21/50  
504/504 [=====] - 0s 189us/step - loss: 0.2563  
Epoch 22/50  
504/504 [=====] - 0s 268us/step - loss: 0.2464  
Epoch 23/50  
504/504 [=====] - 0s 258us/step - loss: 0.2384  
Epoch 24/50  
504/504 [=====] - 0s 209us/step - loss: 0.2317  
Epoch 25/50  
504/504 [=====] - 0s 188us/step - loss: 0.2249  
Epoch 26/50

504/504 [=====] - 0s 199us/step - loss: 0.2189  
Epoch 27/50  
504/504 [=====] - 0s 199us/step - loss: 0.2145  
Epoch 28/50  
504/504 [=====] - 0s 188us/step - loss: 0.2102  
Epoch 29/50  
504/504 [=====] - 0s 179us/step - loss: 0.2061  
Epoch 30/50  
504/504 [=====] - 0s 208us/step - loss: 0.2026  
Epoch 31/50  
504/504 [=====] - 0s 199us/step - loss: 0.1994  
Epoch 32/50  
504/504 [=====] - 0s 189us/step - loss: 0.1969  
Epoch 33/50  
504/504 [=====] - 0s 198us/step - loss: 0.1929  
Epoch 34/50  
504/504 [=====] - 0s 209us/step - loss: 0.1899  
Epoch 35/50  
504/504 [=====] - 0s 188us/step - loss: 0.1867  
Epoch 36/50  
504/504 [=====] - 0s 179us/step - loss: 0.1847  
Epoch 37/50  
504/504 [=====] - 0s 188us/step - loss: 0.1821  
Epoch 38/50  
504/504 [=====] - 0s 208us/step - loss: 0.1798  
Epoch 39/50  
504/504 [=====] - 0s 199us/step - loss: 0.1772  
Epoch 40/50  
504/504 [=====] - 0s 199us/step - loss: 0.1752  
Epoch 41/50  
504/504 [=====] - 0s 179us/step - loss: 0.1741  
Epoch 42/50  
504/504 [=====] - 0s 278us/step - loss: 0.1711  
Epoch 43/50  
504/504 [=====] - 0s 203us/step - loss: 0.1691  
Epoch 44/50  
504/504 [=====] - 0s 186us/step - loss: 0.1675  
Epoch 45/50  
504/504 [=====] - 0s 186us/step - loss: 0.1662  
Epoch 46/50  
504/504 [=====] - 0s 279us/step - loss: 0.1638  
Epoch 47/50  
504/504 [=====] - 0s 217us/step - loss: 0.1630  
Epoch 48/50  
504/504 [=====] - 0s 186us/step - loss: 0.1624  
Epoch 49/50  
504/504 [=====] - 0s 186us/step - loss: 0.1596  
Epoch 50/50

504/504 [=====] - 0s 217us/step - loss: 0.1595  
Epoch 1/50  
504/504 [=====] - 9s 17ms/step - loss: 0.8940  
Epoch 2/50  
504/504 [=====] - 0s 155us/step - loss: 0.8339  
Epoch 3/50  
504/504 [=====] - 0s 186us/step - loss: 0.7846  
Epoch 4/50  
504/504 [=====] - 0s 155us/step - loss: 0.7358  
Epoch 5/50  
504/504 [=====] - 0s 155us/step - loss: 0.6882  
Epoch 6/50  
504/504 [=====] - 0s 186us/step - loss: 0.6353  
Epoch 7/50  
504/504 [=====] - 0s 225us/step - loss: 0.5841  
Epoch 8/50  
504/504 [=====] - 0s 228us/step - loss: 0.5340  
Epoch 9/50  
504/504 [=====] - 0s 219us/step - loss: 0.4881  
Epoch 10/50  
504/504 [=====] - 0s 278us/step - loss: 0.4523  
Epoch 11/50  
504/504 [=====] - 0s 237us/step - loss: 0.4233  
Epoch 12/50  
504/504 [=====] - 0s 256us/step - loss: 0.3939  
Epoch 13/50  
504/504 [=====] - 0s 208us/step - loss: 0.3739  
Epoch 14/50  
504/504 [=====] - 0s 239us/step - loss: 0.3561  
Epoch 15/50  
504/504 [=====] - 0s 218us/step - loss: 0.3420  
Epoch 16/50  
504/504 [=====] - 0s 229us/step - loss: 0.3292  
Epoch 17/50  
504/504 [=====] - 0s 212us/step - loss: 0.3204  
Epoch 18/50  
504/504 [=====] - 0s 155us/step - loss: 0.3112  
Epoch 19/50  
504/504 [=====] - 0s 155us/step - loss: 0.3048  
Epoch 20/50  
504/504 [=====] - 0s 124us/step - loss: 0.2957  
Epoch 21/50  
504/504 [=====] - 0s 155us/step - loss: 0.2887  
Epoch 22/50  
504/504 [=====] - 0s 155us/step - loss: 0.2815  
Epoch 23/50  
504/504 [=====] - 0s 186us/step - loss: 0.2761  
Epoch 24/50

504/504 [=====] - 0s 155us/step - loss: 0.2711  
Epoch 25/50  
504/504 [=====] - 0s 186us/step - loss: 0.2664  
Epoch 26/50  
504/504 [=====] - 0s 186us/step - loss: 0.2590  
Epoch 27/50  
504/504 [=====] - 0s 186us/step - loss: 0.2528  
Epoch 28/50  
504/504 [=====] - 0s 155us/step - loss: 0.2473  
Epoch 29/50  
504/504 [=====] - 0s 186us/step - loss: 0.2423  
Epoch 30/50  
504/504 [=====] - 0s 186us/step - loss: 0.2368  
Epoch 31/50  
504/504 [=====] - 0s 155us/step - loss: 0.2309  
Epoch 32/50  
504/504 [=====] - 0s 217us/step - loss: 0.2258  
Epoch 33/50  
504/504 [=====] - 0s 186us/step - loss: 0.2209  
Epoch 34/50  
504/504 [=====] - 0s 186us/step - loss: 0.2183  
Epoch 35/50  
504/504 [=====] - 0s 155us/step - loss: 0.2137  
Epoch 36/50  
504/504 [=====] - 0s 310us/step - loss: 0.2075  
Epoch 37/50  
504/504 [=====] - 0s 217us/step - loss: 0.2045  
Epoch 38/50  
504/504 [=====] - 0s 217us/step - loss: 0.2012  
Epoch 39/50  
504/504 [=====] - 0s 187us/step - loss: 0.1977  
Epoch 40/50  
504/504 [=====] - 0s 179us/step - loss: 0.1948  
Epoch 41/50  
504/504 [=====] - 0s 199us/step - loss: 0.1911  
Epoch 42/50  
504/504 [=====] - 0s 178us/step - loss: 0.1892  
Epoch 43/50  
504/504 [=====] - 0s 179us/step - loss: 0.1868  
Epoch 44/50  
504/504 [=====] - 0s 198us/step - loss: 0.1816  
Epoch 45/50  
504/504 [=====] - 0s 188us/step - loss: 0.1793  
Epoch 46/50  
504/504 [=====] - 0s 199us/step - loss: 0.1768  
Epoch 47/50  
504/504 [=====] - 0s 248us/step - loss: 0.1747  
Epoch 48/50

504/504 [=====] - 0s 189us/step - loss: 0.1735  
 Epoch 49/50  
 504/504 [=====] - 0s 188us/step - loss: 0.1722  
 Epoch 50/50  
 504/504 [=====] - 0s 228us/step - loss: 0.1673  
 Epoch 1/50  
 504/504 [=====] - 9s 18ms/step - loss: 1.0516  
 Epoch 2/50  
 504/504 [=====] - 0s 208us/step - loss: 0.8816  
 Epoch 3/50  
 504/504 [=====] - 0s 198us/step - loss: 0.7722  
 Epoch 4/50  
 504/504 [=====] - 0s 189us/step - loss: 0.6936  
 Epoch 5/50  
 504/504 [=====] - 0s 198us/step - loss: 0.6348  
 Epoch 6/50  
 504/504 [=====] - 0s 219us/step - loss: 0.5795  
 Epoch 7/50  
 504/504 [=====] - 0s 178us/step - loss: 0.5368  
 Epoch 8/50  
 504/504 [=====] - 0s 229us/step - loss: 0.4966  
 Epoch 9/50  
 504/504 [=====] - 0s 198us/step - loss: 0.4612  
 Epoch 10/50  
 504/504 [=====] - 0s 199us/step - loss: 0.4359  
 Epoch 11/50  
 504/504 [=====] - 0s 211us/step - loss: 0.4139  
 Epoch 12/50  
 504/504 [=====] - 0s 241us/step - loss: 0.3960  
 Epoch 13/50  
 504/504 [=====] - 0s 341us/step - loss: 0.3770  
 Epoch 14/50  
 504/504 [=====] - 0s 186us/step - loss: 0.3607  
 Epoch 15/50  
 504/504 [=====] - 0s 242us/step - loss: 0.3456  
 Epoch 16/50  
 504/504 [=====] - 0s 188us/step - loss: 0.3286  
 Epoch 17/50  
 504/504 [=====] - 0s 199us/step - loss: 0.3145  
 Epoch 18/50  
 504/504 [=====] - 0s 199us/step - loss: 0.3023  
 Epoch 19/50  
 504/504 [=====] - 0s 181us/step - loss: 0.2906  
 Epoch 20/50  
 504/504 [=====] - 0s 199us/step - loss: 0.2761  
 Epoch 21/50  
 504/504 [=====] - 0s 246us/step - loss: 0.2636  
 Epoch 22/50

504/504 [=====] - 0s 198us/step - loss: 0.2526  
Epoch 23/50  
504/504 [=====] - 0s 189us/step - loss: 0.2435  
Epoch 24/50  
504/504 [=====] - 0s 179us/step - loss: 0.2369  
Epoch 25/50  
504/504 [=====] - 0s 228us/step - loss: 0.2309  
Epoch 26/50  
504/504 [=====] - 0s 228us/step - loss: 0.2225  
Epoch 27/50  
504/504 [=====] - 0s 189us/step - loss: 0.2161  
Epoch 28/50  
504/504 [=====] - 0s 189us/step - loss: 0.2108  
Epoch 29/50  
504/504 [=====] - 0s 178us/step - loss: 0.2071  
Epoch 30/50  
504/504 [=====] - 0s 198us/step - loss: 0.2023  
Epoch 31/50  
504/504 [=====] - 0s 189us/step - loss: 0.1993  
Epoch 32/50  
504/504 [=====] - 0s 198us/step - loss: 0.1939  
Epoch 33/50  
504/504 [=====] - 0s 199us/step - loss: 0.1899  
Epoch 34/50  
504/504 [=====] - 0s 198us/step - loss: 0.1874  
Epoch 35/50  
504/504 [=====] - 0s 178us/step - loss: 0.1834  
Epoch 36/50  
504/504 [=====] - 0s 188us/step - loss: 0.1795  
Epoch 37/50  
504/504 [=====] - 0s 199us/step - loss: 0.1763  
Epoch 38/50  
504/504 [=====] - 0s 179us/step - loss: 0.1728  
Epoch 39/50  
504/504 [=====] - 0s 198us/step - loss: 0.1705  
Epoch 40/50  
504/504 [=====] - 0s 198us/step - loss: 0.1677  
Epoch 41/50  
504/504 [=====] - 0s 179us/step - loss: 0.1681  
Epoch 42/50  
504/504 [=====] - 0s 189us/step - loss: 0.1647  
Epoch 43/50  
504/504 [=====] - 0s 179us/step - loss: 0.1661  
Epoch 44/50  
504/504 [=====] - 0s 198us/step - loss: 0.1585  
Epoch 45/50  
504/504 [=====] - 0s 179us/step - loss: 0.1577  
Epoch 46/50



504/504 [=====] - 0s 179us/step - loss: 0.1551  
 Epoch 47/50  
 504/504 [=====] - 0s 188us/step - loss: 0.1528  
 Epoch 48/50  
 504/504 [=====] - 0s 179us/step - loss: 0.1520  
 Epoch 49/50  
 504/504 [=====] - 0s 188us/step - loss: 0.1537  
 Epoch 50/50  
 504/504 [=====] - 0s 189us/step - loss: 0.1487  
 Epoch 1/50  
 504/504 [=====] - 8s 15ms/step - loss: 1.0614  
 Epoch 2/50  
 504/504 [=====] - 0s 186us/step - loss: 0.8290  
 Epoch 3/50  
 504/504 [=====] - 0s 217us/step - loss: 0.7295  
 Epoch 4/50  
 504/504 [=====] - 0s 217us/step - loss: 0.6675  
 Epoch 5/50  
 504/504 [=====] - 0s 186us/step - loss: 0.6206  
 Epoch 6/50  
 504/504 [=====] - 0s 186us/step - loss: 0.5775  
 Epoch 7/50  
 504/504 [=====] - 0s 186us/step - loss: 0.5460  
 Epoch 8/50  
 504/504 [=====] - 0s 186us/step - loss: 0.5174  
 Epoch 9/50  
 504/504 [=====] - 0s 217us/step - loss: 0.4910  
 Epoch 10/50  
 504/504 [=====] - 0s 217us/step - loss: 0.4690  
 Epoch 11/50  
 504/504 [=====] - 0s 186us/step - loss: 0.4472  
 Epoch 12/50  
 504/504 [=====] - 0s 220us/step - loss: 0.4257  
 Epoch 13/50  
 504/504 [=====] - 0s 186us/step - loss: 0.4104  
 Epoch 14/50  
 504/504 [=====] - 0s 217us/step - loss: 0.3948  
 Epoch 15/50  
 504/504 [=====] - 0s 186us/step - loss: 0.3811  
 Epoch 16/50  
 504/504 [=====] - 0s 186us/step - loss: 0.3670  
 Epoch 17/50  
 504/504 [=====] - 0s 186us/step - loss: 0.3545  
 Epoch 18/50  
 504/504 [=====] - 0s 186us/step - loss: 0.3438  
 Epoch 19/50  
 504/504 [=====] - 0s 186us/step - loss: 0.3296  
 Epoch 20/50

504/504 [=====] - 0s 155us/step - loss: 0.3195  
Epoch 21/50  
504/504 [=====] - 0s 155us/step - loss: 0.3095  
Epoch 22/50  
504/504 [=====] - 0s 155us/step - loss: 0.3002  
Epoch 23/50  
504/504 [=====] - 0s 248us/step - loss: 0.2905  
Epoch 24/50  
504/504 [=====] - 0s 310us/step - loss: 0.2837  
Epoch 25/50  
504/504 [=====] - 0s 279us/step - loss: 0.2761  
Epoch 26/50  
504/504 [=====] - 0s 186us/step - loss: 0.2704  
Epoch 27/50  
504/504 [=====] - 0s 186us/step - loss: 0.2635  
Epoch 28/50  
504/504 [=====] - 0s 186us/step - loss: 0.2580  
Epoch 29/50  
504/504 [=====] - 0s 186us/step - loss: 0.2517  
Epoch 30/50  
504/504 [=====] - 0s 186us/step - loss: 0.2473  
Epoch 31/50  
504/504 [=====] - 0s 186us/step - loss: 0.2422  
Epoch 32/50  
504/504 [=====] - 0s 217us/step - loss: 0.2378  
Epoch 33/50  
504/504 [=====] - 0s 186us/step - loss: 0.2329  
Epoch 34/50  
504/504 [=====] - 0s 217us/step - loss: 0.2303  
Epoch 35/50  
504/504 [=====] - 0s 186us/step - loss: 0.2255  
Epoch 36/50  
504/504 [=====] - 0s 186us/step - loss: 0.2221  
Epoch 37/50  
504/504 [=====] - 0s 186us/step - loss: 0.2186  
Epoch 38/50  
504/504 [=====] - 0s 186us/step - loss: 0.2159  
Epoch 39/50  
504/504 [=====] - 0s 186us/step - loss: 0.2126  
Epoch 40/50  
504/504 [=====] - 0s 186us/step - loss: 0.2100  
Epoch 41/50  
504/504 [=====] - 0s 217us/step - loss: 0.2059  
Epoch 42/50  
504/504 [=====] - 0s 186us/step - loss: 0.2035  
Epoch 43/50  
504/504 [=====] - 0s 186us/step - loss: 0.2000  
Epoch 44/50

504/504 [=====] - 0s 217us/step - loss: 0.1975  
Epoch 45/50  
504/504 [=====] - 0s 186us/step - loss: 0.1956  
Epoch 46/50  
504/504 [=====] - 0s 186us/step - loss: 0.1928  
Epoch 47/50  
504/504 [=====] - 0s 186us/step - loss: 0.1913  
Epoch 48/50  
504/504 [=====] - 0s 186us/step - loss: 0.1891  
Epoch 49/50  
504/504 [=====] - 0s 217us/step - loss: 0.1872  
Epoch 50/50  
504/504 [=====] - 0s 217us/step - loss: 0.1866  
Epoch 1/50  
504/504 [=====] - 8s 16ms/step - loss: 1.2707  
Epoch 2/50  
504/504 [=====] - 0s 186us/step - loss: 1.0890  
Epoch 3/50  
504/504 [=====] - 0s 156us/step - loss: 0.9586  
Epoch 4/50  
504/504 [=====] - 0s 155us/step - loss: 0.8595  
Epoch 5/50  
504/504 [=====] - 0s 155us/step - loss: 0.7781  
Epoch 6/50  
504/504 [=====] - 0s 155us/step - loss: 0.7014  
Epoch 7/50  
504/504 [=====] - 0s 155us/step - loss: 0.6350  
Epoch 8/50  
504/504 [=====] - 0s 155us/step - loss: 0.5862  
Epoch 9/50  
504/504 [=====] - 0s 186us/step - loss: 0.5383  
Epoch 10/50  
504/504 [=====] - 0s 155us/step - loss: 0.5023  
Epoch 11/50  
504/504 [=====] - 0s 155us/step - loss: 0.4691  
Epoch 12/50  
504/504 [=====] - 0s 186us/step - loss: 0.4433  
Epoch 13/50  
504/504 [=====] - 0s 155us/step - loss: 0.4200  
Epoch 14/50  
504/504 [=====] - 0s 155us/step - loss: 0.4025  
Epoch 15/50  
504/504 [=====] - 0s 155us/step - loss: 0.3869  
Epoch 16/50  
504/504 [=====] - 0s 155us/step - loss: 0.3714  
Epoch 17/50  
504/504 [=====] - 0s 186us/step - loss: 0.3588  
Epoch 18/50

504/504 [=====] - 0s 155us/step - loss: 0.3476  
Epoch 19/50  
504/504 [=====] - 0s 155us/step - loss: 0.3364  
Epoch 20/50  
504/504 [=====] - 0s 155us/step - loss: 0.3281  
Epoch 21/50  
504/504 [=====] - 0s 186us/step - loss: 0.3190  
Epoch 22/50  
504/504 [=====] - 0s 155us/step - loss: 0.3103  
Epoch 23/50  
504/504 [=====] - 0s 155us/step - loss: 0.3016  
Epoch 24/50  
504/504 [=====] - 0s 186us/step - loss: 0.2945  
Epoch 25/50  
504/504 [=====] - 0s 186us/step - loss: 0.2867  
Epoch 26/50  
504/504 [=====] - 0s 155us/step - loss: 0.2768  
Epoch 27/50  
504/504 [=====] - 0s 155us/step - loss: 0.2714  
Epoch 28/50  
504/504 [=====] - 0s 217us/step - loss: 0.2593  
Epoch 29/50  
504/504 [=====] - 0s 155us/step - loss: 0.2497  
Epoch 30/50  
504/504 [=====] - 0s 155us/step - loss: 0.2410  
Epoch 31/50  
504/504 [=====] - 0s 155us/step - loss: 0.2332  
Epoch 32/50  
504/504 [=====] - 0s 155us/step - loss: 0.2251  
Epoch 33/50  
504/504 [=====] - 0s 155us/step - loss: 0.2202  
Epoch 34/50  
504/504 [=====] - 0s 186us/step - loss: 0.2152  
Epoch 35/50  
504/504 [=====] - 0s 186us/step - loss: 0.2108  
Epoch 36/50  
504/504 [=====] - 0s 186us/step - loss: 0.2047  
Epoch 37/50  
504/504 [=====] - 0s 155us/step - loss: 0.2005  
Epoch 38/50  
504/504 [=====] - 0s 186us/step - loss: 0.1969  
Epoch 39/50  
504/504 [=====] - 0s 186us/step - loss: 0.1928  
Epoch 40/50  
504/504 [=====] - 0s 155us/step - loss: 0.1875  
Epoch 41/50  
504/504 [=====] - 0s 155us/step - loss: 0.1838  
Epoch 42/50

504/504 [=====] - 0s 155us/step - loss: 0.1808  
 Epoch 43/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1771  
 Epoch 44/50  
 504/504 [=====] - 0s 248us/step - loss: 0.1725  
 Epoch 45/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1701  
 Epoch 46/50  
 504/504 [=====] - 0s 217us/step - loss: 0.1665  
 Epoch 47/50  
 504/504 [=====] - 0s 222us/step - loss: 0.1649  
 Epoch 48/50  
 504/504 [=====] - 0s 179us/step - loss: 0.1618  
 Epoch 49/50  
 504/504 [=====] - 0s 198us/step - loss: 0.1599  
 Epoch 50/50  
 504/504 [=====] - 0s 228us/step - loss: 0.1560  
 Epoch 1/50  
 504/504 [=====] - 10s 19ms/step - loss: 0.9607  
 Epoch 2/50  
 504/504 [=====] - 0s 248us/step - loss: 0.8976  
 Epoch 3/50  
 504/504 [=====] - 0s 186us/step - loss: 0.8427  
 Epoch 4/50  
 504/504 [=====] - 0s 155us/step - loss: 0.7795  
 Epoch 5/50  
 504/504 [=====] - 0s 186us/step - loss: 0.7166  
 Epoch 6/50  
 504/504 [=====] - 0s 186us/step - loss: 0.6605  
 Epoch 7/50  
 504/504 [=====] - 0s 155us/step - loss: 0.6055  
 Epoch 8/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5619  
 Epoch 9/50  
 504/504 [=====] - 0s 155us/step - loss: 0.5293  
 Epoch 10/50  
 504/504 [=====] - 0s 186us/step - loss: 0.4942  
 Epoch 11/50  
 504/504 [=====] - 0s 223us/step - loss: 0.4656  
 Epoch 12/50  
 504/504 [=====] - 0s 186us/step - loss: 0.4395  
 Epoch 13/50  
 504/504 [=====] - 0s 217us/step - loss: 0.4176  
 Epoch 14/50  
 504/504 [=====] - 0s 186us/step - loss: 0.3979  
 Epoch 15/50  
 504/504 [=====] - 0s 186us/step - loss: 0.3759  
 Epoch 16/50

504/504 [=====] - 0s 217us/step - loss: 0.3587  
 Epoch 17/50  
 504/504 [=====] - 0s 186us/step - loss: 0.3425  
 Epoch 18/50  
 504/504 [=====] - 0s 217us/step - loss: 0.3253  
 Epoch 19/50  
 504/504 [=====] - 0s 245us/step - loss: 0.3118  
 Epoch 20/50  
 504/504 [=====] - 0s 238us/step - loss: 0.3003  
 Epoch 21/50  
 504/504 [=====] - 0s 229us/step - loss: 0.2877  
 Epoch 22/50  
 504/504 [=====] - 0s 238us/step - loss: 0.2799  
 Epoch 23/50  
 504/504 [=====] - 0s 208us/step - loss: 0.2701  
 Epoch 24/50  
 504/504 [=====] - 0s 239us/step - loss: 0.2623  
 Epoch 25/50  
 504/504 [=====] - 0s 208us/step - loss: 0.2547  
 Epoch 26/50  
 504/504 [=====] - 0s 278us/step - loss: 0.2489  
 Epoch 27/50  
 504/504 [=====] - 0s 224us/step - loss: 0.2430  
 Epoch 28/50  
 504/504 [=====] - 0s 235us/step - loss: 0.2371  
 Epoch 29/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2318  
 Epoch 30/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2253  
 Epoch 31/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2199  
 Epoch 32/50  
 504/504 [=====] - 0s 217us/step - loss: 0.2152  
 Epoch 33/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2107  
 Epoch 34/50  
 504/504 [=====] - 0s 217us/step - loss: 0.2075  
 Epoch 35/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2034  
 Epoch 36/50  
 504/504 [=====] - 0s 217us/step - loss: 0.1999  
 Epoch 37/50  
 504/504 [=====] - 0s 217us/step - loss: 0.1968  
 Epoch 38/50  
 504/504 [=====] - 0s 186us/step - loss: 0.1953  
 Epoch 39/50  
 504/504 [=====] - 0s 217us/step - loss: 0.1919  
 Epoch 40/50

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504/504 [=====] - 0s 186us/step - loss: 0.1889
Epoch 41/50
504/504 [=====] - 0s 155us/step - loss: 0.1874
Epoch 42/50
504/504 [=====] - 0s 186us/step - loss: 0.1853
Epoch 43/50
504/504 [=====] - 0s 186us/step - loss: 0.1811
Epoch 44/50
504/504 [=====] - 0s 186us/step - loss: 0.1782
Epoch 45/50
504/504 [=====] - 0s 186us/step - loss: 0.1756
Epoch 46/50
504/504 [=====] - 0s 155us/step - loss: 0.1746
Epoch 47/50
504/504 [=====] - 0s 186us/step - loss: 0.1715
Epoch 48/50
504/504 [=====] - 0s 186us/step - loss: 0.1696
Epoch 49/50
504/504 [=====] - 0s 186us/step - loss: 0.1670
Epoch 50/50
504/504 [=====] - 0s 217us/step - loss: 0.1661
Epoch 1/50
504/504 [=====] - 9s 17ms/step - loss: 1.2945
Epoch 2/50
504/504 [=====] - 0s 219us/step - loss: 0.9859
Epoch 3/50
504/504 [=====] - 0s 268us/step - loss: 0.8834
Epoch 4/50
504/504 [=====] - 0s 199us/step - loss: 0.8084
Epoch 5/50
504/504 [=====] - 0s 199us/step - loss: 0.7542
Epoch 6/50
504/504 [=====] - 0s 188us/step - loss: 0.7121
Epoch 7/50
504/504 [=====] - ETA: 0s - loss: 0.656 - 0s 258us/step
- loss: 0.6784
Epoch 8/50
504/504 [=====] - 0s 209us/step - loss: 0.6452
Epoch 9/50
504/504 [=====] - 0s 198us/step - loss: 0.6185
Epoch 10/50
504/504 [=====] - 0s 178us/step - loss: 0.5936
Epoch 11/50
504/504 [=====] - 0s 188us/step - loss: 0.5727
Epoch 12/50
504/504 [=====] - 0s 179us/step - loss: 0.5474
Epoch 13/50
504/504 [=====] - 0s 199us/step - loss: 0.5281

```

Epoch 14/50  
504/504 [=====] - 0s 188us/step - loss: 0.5088  
Epoch 15/50  
504/504 [=====] - 0s 189us/step - loss: 0.4883  
Epoch 16/50  
504/504 [=====] - 0s 198us/step - loss: 0.4697  
Epoch 17/50  
504/504 [=====] - 0s 199us/step - loss: 0.4488  
Epoch 18/50  
504/504 [=====] - 0s 209us/step - loss: 0.4289  
Epoch 19/50  
504/504 [=====] - 0s 199us/step - loss: 0.4086  
Epoch 20/50  
504/504 [=====] - 0s 188us/step - loss: 0.3911  
Epoch 21/50  
504/504 [=====] - 0s 179us/step - loss: 0.3702  
Epoch 22/50  
504/504 [=====] - 0s 178us/step - loss: 0.3552  
Epoch 23/50  
504/504 [=====] - 0s 193us/step - loss: 0.3386  
Epoch 24/50  
504/504 [=====] - 0s 155us/step - loss: 0.3246  
Epoch 25/50  
504/504 [=====] - 0s 155us/step - loss: 0.3147  
Epoch 26/50  
504/504 [=====] - 0s 155us/step - loss: 0.3019  
Epoch 27/50  
504/504 [=====] - 0s 155us/step - loss: 0.2900  
Epoch 28/50  
504/504 [=====] - 0s 155us/step - loss: 0.2810  
Epoch 29/50  
504/504 [=====] - 0s 155us/step - loss: 0.2716  
Epoch 30/50  
504/504 [=====] - 0s 155us/step - loss: 0.2637  
Epoch 31/50  
504/504 [=====] - 0s 155us/step - loss: 0.2552  
Epoch 32/50  
504/504 [=====] - 0s 155us/step - loss: 0.2472  
Epoch 33/50  
504/504 [=====] - 0s 155us/step - loss: 0.2382  
Epoch 34/50  
504/504 [=====] - 0s 155us/step - loss: 0.2308  
Epoch 35/50  
504/504 [=====] - 0s 155us/step - loss: 0.2208  
Epoch 36/50  
504/504 [=====] - 0s 155us/step - loss: 0.2152  
Epoch 37/50  
504/504 [=====] - 0s 155us/step - loss: 0.2053



Epoch 38/50  
504/504 [=====] - 0s 155us/step - loss: 0.1997  
Epoch 39/50  
504/504 [=====] - 0s 186us/step - loss: 0.1923  
Epoch 40/50  
504/504 [=====] - 0s 186us/step - loss: 0.1869  
Epoch 41/50  
504/504 [=====] - 0s 155us/step - loss: 0.1821  
Epoch 42/50  
504/504 [=====] - 0s 155us/step - loss: 0.1750  
Epoch 43/50  
504/504 [=====] - 0s 155us/step - loss: 0.1706  
Epoch 44/50  
504/504 [=====] - 0s 186us/step - loss: 0.1658  
Epoch 45/50  
504/504 [=====] - 0s 186us/step - loss: 0.1617  
Epoch 46/50  
504/504 [=====] - 0s 155us/step - loss: 0.1573  
Epoch 47/50  
504/504 [=====] - 0s 186us/step - loss: 0.1540  
Epoch 48/50  
504/504 [=====] - 0s 186us/step - loss: 0.1509  
Epoch 49/50  
504/504 [=====] - 0s 186us/step - loss: 0.1484  
Epoch 50/50  
504/504 [=====] - 0s 217us/step - loss: 0.1455  
Epoch 1/50  
504/504 [=====] - 9s 17ms/step - loss: 1.0675  
Epoch 2/50  
504/504 [=====] - 0s 248us/step - loss: 0.9473  
Epoch 3/50  
504/504 [=====] - 0s 248us/step - loss: 0.8598  
Epoch 4/50  
504/504 [=====] - 0s 217us/step - loss: 0.7815  
Epoch 5/50  
504/504 [=====] - 0s 186us/step - loss: 0.7093  
Epoch 6/50  
504/504 [=====] - 0s 217us/step - loss: 0.6479  
Epoch 7/50  
504/504 [=====] - 0s 186us/step - loss: 0.5973  
Epoch 8/50  
504/504 [=====] - 0s 186us/step - loss: 0.5582  
Epoch 9/50  
504/504 [=====] - 0s 155us/step - loss: 0.5249  
Epoch 10/50  
504/504 [=====] - 0s 155us/step - loss: 0.4944  
Epoch 11/50  
504/504 [=====] - 0s 186us/step - loss: 0.4692

Epoch 12/50  
504/504 [=====] - 0s 155us/step - loss: 0.4491  
Epoch 13/50  
504/504 [=====] - 0s 186us/step - loss: 0.4307  
Epoch 14/50  
504/504 [=====] - 0s 186us/step - loss: 0.4144  
Epoch 15/50  
504/504 [=====] - 0s 155us/step - loss: 0.3987  
Epoch 16/50  
504/504 [=====] - 0s 155us/step - loss: 0.3850  
Epoch 17/50  
504/504 [=====] - 0s 155us/step - loss: 0.3707  
Epoch 18/50  
504/504 [=====] - 0s 186us/step - loss: 0.3563  
Epoch 19/50  
504/504 [=====] - 0s 155us/step - loss: 0.3432  
Epoch 20/50  
504/504 [=====] - 0s 155us/step - loss: 0.3309  
Epoch 21/50  
504/504 [=====] - 0s 186us/step - loss: 0.3208  
Epoch 22/50  
504/504 [=====] - 0s 186us/step - loss: 0.3091  
Epoch 23/50  
504/504 [=====] - 0s 256us/step - loss: 0.2949  
Epoch 24/50  
504/504 [=====] - 0s 186us/step - loss: 0.2864  
Epoch 25/50  
504/504 [=====] - 0s 186us/step - loss: 0.2739  
Epoch 26/50  
504/504 [=====] - 0s 155us/step - loss: 0.2639  
Epoch 27/50  
504/504 [=====] - 0s 186us/step - loss: 0.2567  
Epoch 28/50  
504/504 [=====] - 0s 186us/step - loss: 0.2501  
Epoch 29/50  
504/504 [=====] - 0s 155us/step - loss: 0.2434  
Epoch 30/50  
504/504 [=====] - 0s 186us/step - loss: 0.2372  
Epoch 31/50  
504/504 [=====] - 0s 186us/step - loss: 0.2317  
Epoch 32/50  
504/504 [=====] - 0s 155us/step - loss: 0.2263  
Epoch 33/50  
504/504 [=====] - 0s 155us/step - loss: 0.2217  
Epoch 34/50  
504/504 [=====] - 0s 155us/step - loss: 0.2178  
Epoch 35/50  
504/504 [=====] - 0s 186us/step - loss: 0.2149

Epoch 36/50  
504/504 [=====] - 0s 186us/step - loss: 0.2121  
Epoch 37/50  
504/504 [=====] - 0s 155us/step - loss: 0.2094  
Epoch 38/50  
504/504 [=====] - 0s 217us/step - loss: 0.2046  
Epoch 39/50  
504/504 [=====] - 0s 186us/step - loss: 0.2019  
Epoch 40/50  
504/504 [=====] - 0s 186us/step - loss: 0.1996  
Epoch 41/50  
504/504 [=====] - 0s 186us/step - loss: 0.1957  
Epoch 42/50  
504/504 [=====] - 0s 186us/step - loss: 0.1915  
Epoch 43/50  
504/504 [=====] - 0s 155us/step - loss: 0.1875  
Epoch 44/50  
504/504 [=====] - 0s 186us/step - loss: 0.1847  
Epoch 45/50  
504/504 [=====] - 0s 186us/step - loss: 0.1820  
Epoch 46/50  
504/504 [=====] - 0s 155us/step - loss: 0.1771  
Epoch 47/50  
504/504 [=====] - 0s 186us/step - loss: 0.1726  
Epoch 48/50  
504/504 [=====] - 0s 186us/step - loss: 0.1707  
Epoch 49/50  
504/504 [=====] - 0s 155us/step - loss: 0.1660  
Epoch 50/50  
504/504 [=====] - 0s 186us/step - loss: 0.1640  
Epoch 1/50  
504/504 [=====] - 9s 18ms/step - loss: 1.3245  
Epoch 2/50  
504/504 [=====] - 0s 262us/step - loss: 1.0962  
Epoch 3/50  
504/504 [=====] - 0s 284us/step - loss: 0.9952  
Epoch 4/50  
504/504 [=====] - 0s 267us/step - loss: 0.9152  
Epoch 5/50  
504/504 [=====] - 0s 238us/step - loss: 0.8436  
Epoch 6/50  
504/504 [=====] - 0s 248us/step - loss: 0.7836  
Epoch 7/50  
504/504 [=====] - 0s 218us/step - loss: 0.7251  
Epoch 8/50  
504/504 [=====] - 0s 228us/step - loss: 0.6701  
Epoch 9/50  
504/504 [=====] - 0s 229us/step - loss: 0.6221

```

Epoch 10/50
504/504 [=====] - 0s 224us/step - loss: 0.5776
Epoch 11/50
504/504 [=====] - 0s 199us/step - loss: 0.5374
Epoch 12/50
504/504 [=====] - 0s 281us/step - loss: 0.5082
Epoch 13/50
504/504 [=====] - 0s 283us/step - loss: 0.4762
Epoch 14/50
504/504 [=====] - 0s 177us/step - loss: 0.4489
Epoch 15/50
504/504 [=====] - 0s 186us/step - loss: 0.4230
Epoch 16/50
504/504 [=====] - 0s 217us/step - loss: 0.4029
Epoch 17/50
504/504 [=====] - 0s 310us/step - loss: 0.3850
Epoch 18/50
504/504 [=====] - 0s 341us/step - loss: 0.3677
Epoch 19/50
504/504 [=====] - 0s 341us/step - loss: 0.3537
Epoch 20/50
504/504 [=====] - 0s 310us/step - loss: 0.3405
Epoch 21/50
504/504 [=====] - 0s 186us/step - loss: 0.3344
Epoch 22/50
504/504 [=====] - 0s 280us/step - loss: 0.3182
Epoch 23/50
504/504 [=====] - 0s 186us/step - loss: 0.3075
Epoch 24/50
504/504 [=====] - 0s 186us/step - loss: 0.3000
Epoch 25/50
504/504 [=====] - 0s 186us/step - loss: 0.2889
Epoch 26/50
504/504 [=====] - 0s 186us/step - loss: 0.2817
Epoch 27/50
504/504 [=====] - 0s 186us/step - loss: 0.2736
Epoch 28/50
504/504 [=====] - 0s 186us/step - loss: 0.2657
Epoch 29/50
504/504 [=====] - 0s 186us/step - loss: 0.2604
Epoch 30/50
504/504 [=====] - 0s 186us/step - loss: 0.2543
Epoch 31/50
504/504 [=====] - ETA: 0s - loss: 0.248 - 0s 186us/step
- loss: 0.2481
Epoch 32/50
504/504 [=====] - 0s 248us/step - loss: 0.2425
Epoch 33/50

```

504/504 [=====] - 0s 205us/step - loss: 0.2363  
 Epoch 34/50  
 504/504 [=====] - 0s 218us/step - loss: 0.2325  
 Epoch 35/50  
 504/504 [=====] - 0s 209us/step - loss: 0.2301  
 Epoch 36/50  
 504/504 [=====] - 0s 208us/step - loss: 0.2238  
 Epoch 37/50  
 504/504 [=====] - 0s 219us/step - loss: 0.2182  
 Epoch 38/50  
 504/504 [=====] - 0s 249us/step - loss: 0.2149  
 Epoch 39/50  
 504/504 [=====] - 0s 229us/step - loss: 0.2099  
 Epoch 40/50  
 504/504 [=====] - 0s 248us/step - loss: 0.2041  
 Epoch 41/50  
 504/504 [=====] - 0s 238us/step - loss: 0.2013  
 Epoch 42/50  
 504/504 [=====] - 0s 219us/step - loss: 0.1987  
 Epoch 43/50  
 504/504 [=====] - 0s 208us/step - loss: 0.1959  
 Epoch 44/50  
 504/504 [=====] - 0s 218us/step - loss: 0.1921  
 Epoch 45/50  
 504/504 [=====] - 0s 219us/step - loss: 0.1909  
 Epoch 46/50  
 504/504 [=====] - 0s 224us/step - loss: 0.1857  
 Epoch 47/50  
 504/504 [=====] - 0s 223us/step - loss: 0.1827  
 Epoch 48/50  
 504/504 [=====] - 0s 199us/step - loss: 0.1816  
 Epoch 49/50  
 504/504 [=====] - 0s 258us/step - loss: 0.1782  
 Epoch 50/50  
 504/504 [=====] - 0s 372us/step - loss: 0.1767  
 Epoch 1/50  
 504/504 [=====] - 9s 17ms/step - loss: 1.2088  
 Epoch 2/50  
 504/504 [=====] - 0s 186us/step - loss: 1.0815  
 Epoch 3/50  
 504/504 [=====] - 0s 186us/step - loss: 1.0230  
 Epoch 4/50  
 504/504 [=====] - 0s 186us/step - loss: 0.9836  
 Epoch 5/50  
 504/504 [=====] - 0s 186us/step - loss: 0.9517  
 Epoch 6/50  
 504/504 [=====] - 0s 186us/step - loss: 0.9197  
 Epoch 7/50

504/504 [=====] - 0s 186us/step - loss: 0.8804  
Epoch 8/50  
504/504 [=====] - 0s 186us/step - loss: 0.8342  
Epoch 9/50  
504/504 [=====] - 0s 186us/step - loss: 0.7758  
Epoch 10/50  
504/504 [=====] - 0s 186us/step - loss: 0.7058  
Epoch 11/50  
504/504 [=====] - 0s 372us/step - loss: 0.6237  
Epoch 12/50  
504/504 [=====] - 0s 218us/step - loss: 0.5440  
Epoch 13/50  
504/504 [=====] - 0s 217us/step - loss: 0.4821  
Epoch 14/50  
504/504 [=====] - 0s 208us/step - loss: 0.4421  
Epoch 15/50  
504/504 [=====] - 0s 199us/step - loss: 0.4158  
Epoch 16/50  
504/504 [=====] - 0s 198us/step - loss: 0.3954  
Epoch 17/50  
504/504 [=====] - 0s 202us/step - loss: 0.3792  
Epoch 18/50  
504/504 [=====] - 0s 199us/step - loss: 0.3649  
Epoch 19/50  
504/504 [=====] - 0s 199us/step - loss: 0.3527  
Epoch 20/50  
504/504 [=====] - 0s 258us/step - loss: 0.3418  
Epoch 21/50  
504/504 [=====] - 0s 218us/step - loss: 0.3300  
Epoch 22/50  
504/504 [=====] - 0s 188us/step - loss: 0.3209  
Epoch 23/50  
504/504 [=====] - 0s 198us/step - loss: 0.3106  
Epoch 24/50  
504/504 [=====] - 0s 219us/step - loss: 0.3010  
Epoch 25/50  
504/504 [=====] - 0s 268us/step - loss: 0.2910  
Epoch 26/50  
504/504 [=====] - 0s 219us/step - loss: 0.2832  
Epoch 27/50  
504/504 [=====] - 0s 208us/step - loss: 0.2745  
Epoch 28/50  
504/504 [=====] - 0s 198us/step - loss: 0.2638  
Epoch 29/50  
504/504 [=====] - 0s 198us/step - loss: 0.2535  
Epoch 30/50  
504/504 [=====] - 0s 208us/step - loss: 0.2435  
Epoch 31/50

504/504 [=====] - 0s 199us/step - loss: 0.2317  
 Epoch 32/50  
 504/504 [=====] - 0s 198us/step - loss: 0.2219  
 Epoch 33/50  
 504/504 [=====] - 0s 218us/step - loss: 0.2136  
 Epoch 34/50  
 504/504 [=====] - 0s 208us/step - loss: 0.2024  
 Epoch 35/50  
 504/504 [=====] - 0s 189us/step - loss: 0.1960  
 Epoch 36/50  
 504/504 [=====] - 0s 198us/step - loss: 0.1885  
 Epoch 37/50  
 504/504 [=====] - 0s 198us/step - loss: 0.1821  
 Epoch 38/50  
 504/504 [=====] - 0s 198us/step - loss: 0.1797  
 Epoch 39/50  
 504/504 [=====] - 0s 198us/step - loss: 0.1729  
 Epoch 40/50  
 504/504 [=====] - 0s 209us/step - loss: 0.1705  
 Epoch 41/50  
 504/504 [=====] - 0s 198us/step - loss: 0.1674  
 Epoch 42/50  
 504/504 [=====] - 0s 199us/step - loss: 0.1627  
 Epoch 43/50  
 504/504 [=====] - 0s 178us/step - loss: 0.1605  
 Epoch 44/50  
 504/504 [=====] - 0s 198us/step - loss: 0.1572  
 Epoch 45/50  
 504/504 [=====] - 0s 169us/step - loss: 0.1558  
 Epoch 46/50  
 504/504 [=====] - 0s 198us/step - loss: 0.1518  
 Epoch 47/50  
 504/504 [=====] - 0s 198us/step - loss: 0.1507  
 Epoch 48/50  
 504/504 [=====] - 0s 189us/step - loss: 0.1481  
 Epoch 49/50  
 504/504 [=====] - 0s 202us/step - loss: 0.1467  
 Epoch 50/50  
 504/504 [=====] - 0s 170us/step - loss: 0.1437  
 Epoch 1/50  
 504/504 [=====] - 10s 19ms/step - loss: 1.0919  
 Epoch 2/50  
 504/504 [=====] - 0s 198us/step - loss: 0.9563  
 Epoch 3/50  
 504/504 [=====] - 0s 219us/step - loss: 0.8696  
 Epoch 4/50  
 504/504 [=====] - 0s 209us/step - loss: 0.8056  
 Epoch 5/50

504/504 [=====] - 0s 218us/step - loss: 0.7537  
Epoch 6/50  
504/504 [=====] - 0s 209us/step - loss: 0.7038  
Epoch 7/50  
504/504 [=====] - 0s 218us/step - loss: 0.6524  
Epoch 8/50  
504/504 [=====] - 0s 209us/step - loss: 0.6049  
Epoch 9/50  
504/504 [=====] - 0s 198us/step - loss: 0.5566  
Epoch 10/50  
504/504 [=====] - 0s 229us/step - loss: 0.5148  
Epoch 11/50  
504/504 [=====] - 0s 228us/step - loss: 0.4775  
Epoch 12/50  
504/504 [=====] - 0s 298us/step - loss: 0.4468  
Epoch 13/50  
504/504 [=====] - 0s 244us/step - loss: 0.4219  
Epoch 14/50  
504/504 [=====] - 0s 155us/step - loss: 0.4017  
Epoch 15/50  
504/504 [=====] - 0s 186us/step - loss: 0.3845  
Epoch 16/50  
504/504 [=====] - 0s 186us/step - loss: 0.3699  
Epoch 17/50  
504/504 [=====] - 0s 186us/step - loss: 0.3568  
Epoch 18/50  
504/504 [=====] - 0s 186us/step - loss: 0.3432  
Epoch 19/50  
504/504 [=====] - 0s 186us/step - loss: 0.3309  
Epoch 20/50  
504/504 [=====] - 0s 217us/step - loss: 0.3207  
Epoch 21/50  
504/504 [=====] - 0s 186us/step - loss: 0.3104  
Epoch 22/50  
504/504 [=====] - 0s 186us/step - loss: 0.3004  
Epoch 23/50  
504/504 [=====] - 0s 186us/step - loss: 0.2912  
Epoch 24/50  
504/504 [=====] - 0s 186us/step - loss: 0.2833  
Epoch 25/50  
504/504 [=====] - 0s 186us/step - loss: 0.2755  
Epoch 26/50  
504/504 [=====] - 0s 155us/step - loss: 0.2700  
Epoch 27/50  
504/504 [=====] - 0s 155us/step - loss: 0.2627  
Epoch 28/50  
504/504 [=====] - 0s 155us/step - loss: 0.2573  
Epoch 29/50



504/504 [=====] - 0s 186us/step - loss: 0.2518  
 Epoch 30/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2467  
 Epoch 31/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2412  
 Epoch 32/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2350  
 Epoch 33/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2304  
 Epoch 34/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2251  
 Epoch 35/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2209  
 Epoch 36/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2162  
 Epoch 37/50  
 504/504 [=====] - 0s 155us/step - loss: 0.2121  
 Epoch 38/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2093  
 Epoch 39/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2041  
 Epoch 40/50  
 504/504 [=====] - 0s 186us/step - loss: 0.2011  
 Epoch 41/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1983  
 Epoch 42/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1943  
 Epoch 43/50  
 504/504 [=====] - 0s 186us/step - loss: 0.1918  
 Epoch 44/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1884  
 Epoch 45/50  
 504/504 [=====] - 0s 186us/step - loss: 0.1850  
 Epoch 46/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1828  
 Epoch 47/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1798  
 Epoch 48/50  
 504/504 [=====] - 0s 186us/step - loss: 0.1788  
 Epoch 49/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1736  
 Epoch 50/50  
 504/504 [=====] - 0s 155us/step - loss: 0.1721  
 Epoch 1/50  
 504/504 [=====] - 10s 19ms/step - loss: 1.0434  
 Epoch 2/50  
 504/504 [=====] - 0s 228us/step - loss: 0.9873  
 Epoch 3/50

```

504/504 [=====] - 0s 209us/step - loss: 0.9548 0s -
loss: 0.945
Epoch 4/50
504/504 [=====] - 0s 209us/step - loss: 0.9216
Epoch 5/50
504/504 [=====] - 0s 247us/step - loss: 0.8859
Epoch 6/50
504/504 [=====] - 0s 198us/step - loss: 0.8394
Epoch 7/50
504/504 [=====] - 0s 295us/step - loss: 0.7818
Epoch 8/50
504/504 [=====] - 0s 220us/step - loss: 0.7216
Epoch 9/50
504/504 [=====] - 0s 196us/step - loss: 0.6578
Epoch 10/50
504/504 [=====] - 0s 186us/step - loss: 0.5971
Epoch 11/50
504/504 [=====] - 0s 186us/step - loss: 0.5368
Epoch 12/50
504/504 [=====] - 0s 217us/step - loss: 0.4872
Epoch 13/50
504/504 [=====] - 0s 186us/step - loss: 0.4461
Epoch 14/50
504/504 [=====] - 0s 186us/step - loss: 0.4144
Epoch 15/50
504/504 [=====] - 0s 186us/step - loss: 0.3883
Epoch 16/50
504/504 [=====] - 0s 186us/step - loss: 0.3712
Epoch 17/50
504/504 [=====] - 0s 186us/step - loss: 0.3569
Epoch 18/50
504/504 [=====] - 0s 186us/step - loss: 0.3440
Epoch 19/50
504/504 [=====] - 0s 186us/step - loss: 0.3325
Epoch 20/50
504/504 [=====] - 0s 186us/step - loss: 0.3239
Epoch 21/50
504/504 [=====] - 0s 186us/step - loss: 0.3104
Epoch 22/50
504/504 [=====] - 0s 186us/step - loss: 0.2995
Epoch 23/50
504/504 [=====] - 0s 217us/step - loss: 0.2866
Epoch 24/50
504/504 [=====] - 0s 217us/step - loss: 0.2772
Epoch 25/50
504/504 [=====] - 0s 248us/step - loss: 0.2666
Epoch 26/50
504/504 [=====] - 0s 217us/step - loss: 0.2589

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Epoch 27/50
504/504 [=====] - 0s 186us/step - loss: 0.2504
Epoch 28/50
504/504 [=====] - 0s 186us/step - loss: 0.2432
Epoch 29/50
504/504 [=====] - 0s 217us/step - loss: 0.2356
Epoch 30/50
504/504 [=====] - 0s 186us/step - loss: 0.2301
Epoch 31/50
504/504 [=====] - 0s 186us/step - loss: 0.2240
Epoch 32/50
504/504 [=====] - 0s 186us/step - loss: 0.2181
Epoch 33/50
504/504 [=====] - 0s 217us/step - loss: 0.2129
Epoch 34/50
504/504 [=====] - 0s 187us/step - loss: 0.2072
Epoch 35/50
504/504 [=====] - 0s 217us/step - loss: 0.2011
Epoch 36/50
504/504 [=====] - 0s 372us/step - loss: 0.1978
Epoch 37/50
504/504 [=====] - 0s 279us/step - loss: 0.1924
Epoch 38/50
504/504 [=====] - 0s 230us/step - loss: 0.1885
Epoch 39/50
504/504 [=====] - 0s 218us/step - loss: 0.1878
Epoch 40/50
504/504 [=====] - 0s 209us/step - loss: 0.1810
Epoch 41/50
504/504 [=====] - 0s 208us/step - loss: 0.1812
Epoch 42/50
504/504 [=====] - 0s 198us/step - loss: 0.1778
Epoch 43/50
504/504 [=====] - 0s 199us/step - loss: 0.1728
Epoch 44/50
504/504 [=====] - 0s 207us/step - loss: 0.1691
Epoch 45/50
504/504 [=====] - 0s 248us/step - loss: 0.1664
Epoch 46/50
504/504 [=====] - 0s 218us/step - loss: 0.1654
Epoch 47/50
504/504 [=====] - 0s 199us/step - loss: 0.1612
Epoch 48/50
504/504 [=====] - 0s 208us/step - loss: 0.1595
Epoch 49/50
504/504 [=====] - 0s 228us/step - loss: 0.1575
Epoch 50/50
504/504 [=====] - 0s 268us/step - loss: 0.1562

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Epoch 1/50  
504/504 [=====] - 10s 20ms/step - loss: 1.0527  
Epoch 2/50  
504/504 [=====] - 0s 259us/step - loss: 0.9595  
Epoch 3/50  
504/504 [=====] - 0s 227us/step - loss: 0.8868  
Epoch 4/50  
504/504 [=====] - 0s 268us/step - loss: 0.8253  
Epoch 5/50  
504/504 [=====] - 0s 228us/step - loss: 0.7676  
Epoch 6/50  
504/504 [=====] - 0s 249us/step - loss: 0.7098  
Epoch 7/50  
504/504 [=====] - 0s 277us/step - loss: 0.6593  
Epoch 8/50  
504/504 [=====] - 0s 218us/step - loss: 0.6112  
Epoch 9/50  
504/504 [=====] - 0s 218us/step - loss: 0.5684  
Epoch 10/50  
504/504 [=====] - 0s 288us/step - loss: 0.5332  
Epoch 11/50  
504/504 [=====] - 0s 254us/step - loss: 0.4976  
Epoch 12/50  
504/504 [=====] - 0s 186us/step - loss: 0.4682  
Epoch 13/50  
504/504 [=====] - 0s 217us/step - loss: 0.4402  
Epoch 14/50  
504/504 [=====] - 0s 310us/step - loss: 0.4156  
Epoch 15/50  
504/504 [=====] - 0s 279us/step - loss: 0.3929  
Epoch 16/50  
504/504 [=====] - 0s 310us/step - loss: 0.3719  
Epoch 17/50  
504/504 [=====] - 0s 217us/step - loss: 0.3541  
Epoch 18/50  
504/504 [=====] - 0s 186us/step - loss: 0.3380  
Epoch 19/50  
504/504 [=====] - 0s 155us/step - loss: 0.3226  
Epoch 20/50  
504/504 [=====] - 0s 155us/step - loss: 0.3069  
Epoch 21/50  
504/504 [=====] - 0s 186us/step - loss: 0.2926  
Epoch 22/50  
504/504 [=====] - 0s 217us/step - loss: 0.2782  
Epoch 23/50  
504/504 [=====] - 0s 155us/step - loss: 0.2659  
Epoch 24/50  
504/504 [=====] - 0s 186us/step - loss: 0.2561

Epoch 25/50  
504/504 [=====] - 0s 186us/step - loss: 0.2455  
Epoch 26/50  
504/504 [=====] - 0s 217us/step - loss: 0.2364  
Epoch 27/50  
504/504 [=====] - 0s 186us/step - loss: 0.2276  
Epoch 28/50  
504/504 [=====] - 0s 217us/step - loss: 0.2210  
Epoch 29/50  
504/504 [=====] - 0s 186us/step - loss: 0.2133  
Epoch 30/50  
504/504 [=====] - 0s 217us/step - loss: 0.2062  
Epoch 31/50  
504/504 [=====] - 0s 279us/step - loss: 0.2028  
Epoch 32/50  
504/504 [=====] - 0s 232us/step - loss: 0.1965  
Epoch 33/50  
504/504 [=====] - 0s 209us/step - loss: 0.1910  
Epoch 34/50  
504/504 [=====] - 0s 307us/step - loss: 0.1873  
Epoch 35/50  
504/504 [=====] - 0s 219us/step - loss: 0.1824  
Epoch 36/50  
504/504 [=====] - 0s 248us/step - loss: 0.1772  
Epoch 37/50  
504/504 [=====] - 0s 199us/step - loss: 0.1747  
Epoch 38/50  
504/504 [=====] - 0s 267us/step - loss: 0.1710  
Epoch 39/50  
504/504 [=====] - 0s 209us/step - loss: 0.1693  
Epoch 40/50  
504/504 [=====] - 0s 193us/step - loss: 0.1652  
Epoch 41/50  
504/504 [=====] - 0s 217us/step - loss: 0.1637  
Epoch 42/50  
504/504 [=====] - 0s 252us/step - loss: 0.1606  
Epoch 43/50  
504/504 [=====] - 0s 186us/step - loss: 0.1572  
Epoch 44/50  
504/504 [=====] - 0s 186us/step - loss: 0.1563  
Epoch 45/50  
504/504 [=====] - 0s 186us/step - loss: 0.1540  
Epoch 46/50  
504/504 [=====] - 0s 217us/step - loss: 0.1525  
Epoch 47/50  
504/504 [=====] - 0s 186us/step - loss: 0.1518  
Epoch 48/50  
504/504 [=====] - 0s 186us/step - loss: 0.1491

Epoch 49/50  
504/504 [=====] - 0s 186us/step - loss: 0.1485  
Epoch 50/50  
504/504 [=====] - 0s 186us/step - loss: 0.1453  
Epoch 1/50  
504/504 [=====] - 9s 19ms/step - loss: 1.2633  
Epoch 2/50  
504/504 [=====] - 0s 209us/step - loss: 1.0691  
Epoch 3/50  
504/504 [=====] - 0s 179us/step - loss: 0.9687  
Epoch 4/50  
504/504 [=====] - 0s 198us/step - loss: 0.9268  
Epoch 5/50  
504/504 [=====] - 0s 209us/step - loss: 0.8892  
Epoch 6/50  
504/504 [=====] - 0s 227us/step - loss: 0.8550  
Epoch 7/50  
504/504 [=====] - 0s 248us/step - loss: 0.8213  
Epoch 8/50  
504/504 [=====] - 0s 217us/step - loss: 0.7826  
Epoch 9/50  
504/504 [=====] - 0s 209us/step - loss: 0.7422  
Epoch 10/50  
504/504 [=====] - 0s 218us/step - loss: 0.6955  
Epoch 11/50  
504/504 [=====] - 0s 249us/step - loss: 0.6493  
Epoch 12/50  
504/504 [=====] - 0s 208us/step - loss: 0.6002  
Epoch 13/50  
504/504 [=====] - 0s 219us/step - loss: 0.5504  
Epoch 14/50  
504/504 [=====] - 0s 218us/step - loss: 0.5031  
Epoch 15/50  
504/504 [=====] - 0s 208us/step - loss: 0.4619  
Epoch 16/50  
504/504 [=====] - 0s 228us/step - loss: 0.4187  
Epoch 17/50  
504/504 [=====] - 0s 219us/step - loss: 0.3850  
Epoch 18/50  
504/504 [=====] - 0s 228us/step - loss: 0.3576  
Epoch 19/50  
504/504 [=====] - 0s 218us/step - loss: 0.3335  
Epoch 20/50  
504/504 [=====] - 0s 199us/step - loss: 0.3157  
Epoch 21/50  
504/504 [=====] - 0s 218us/step - loss: 0.2985  
Epoch 22/50  
504/504 [=====] - 0s 198us/step - loss: 0.2865

Epoch 23/50  
504/504 [=====] - 0s 218us/step - loss: 0.2743  
Epoch 24/50  
504/504 [=====] - 0s 269us/step - loss: 0.2639  
Epoch 25/50  
504/504 [=====] - 0s 218us/step - loss: 0.2535  
Epoch 26/50  
504/504 [=====] - 0s 228us/step - loss: 0.2460  
Epoch 27/50  
504/504 [=====] - 0s 288us/step - loss: 0.2392  
Epoch 28/50  
504/504 [=====] - 0s 257us/step - loss: 0.2320  
Epoch 29/50  
504/504 [=====] - 0s 258us/step - loss: 0.2234  
Epoch 30/50  
504/504 [=====] - 0s 237us/step - loss: 0.2165  
Epoch 31/50  
504/504 [=====] - 0s 229us/step - loss: 0.2085  
Epoch 32/50  
504/504 [=====] - 0s 239us/step - loss: 0.2004  
Epoch 33/50  
504/504 [=====] - 0s 227us/step - loss: 0.1925  
Epoch 34/50  
504/504 [=====] - 0s 218us/step - loss: 0.1840  
Epoch 35/50  
504/504 [=====] - 0s 198us/step - loss: 0.1775  
Epoch 36/50  
504/504 [=====] - 0s 199us/step - loss: 0.1710  
Epoch 37/50  
504/504 [=====] - 0s 208us/step - loss: 0.1645  
Epoch 38/50  
504/504 [=====] - 0s 219us/step - loss: 0.1587  
Epoch 39/50  
504/504 [=====] - 0s 228us/step - loss: 0.1526  
Epoch 40/50  
504/504 [=====] - 0s 208us/step - loss: 0.1483  
Epoch 41/50  
504/504 [=====] - 0s 198us/step - loss: 0.1441  
Epoch 42/50  
504/504 [=====] - 0s 249us/step - loss: 0.1401  
Epoch 43/50  
504/504 [=====] - 0s 238us/step - loss: 0.1378  
Epoch 44/50  
504/504 [=====] - 0s 228us/step - loss: 0.1345  
Epoch 45/50  
504/504 [=====] - 0s 199us/step - loss: 0.1324  
Epoch 46/50  
504/504 [=====] - 0s 226us/step - loss: 0.1286

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Epoch 47/50
504/504 [=====] - 0s 186us/step - loss: 0.1259
Epoch 48/50
504/504 [=====] - 0s 155us/step - loss: 0.1240
Epoch 49/50
504/504 [=====] - 0s 248us/step - loss: 0.1223
Epoch 50/50
504/504 [=====] - 0s 248us/step - loss: 0.1212
Epoch 1/50
504/504 [=====] - 10s 19ms/step - loss: 1.8260
Epoch 2/50
504/504 [=====] - 0s 186us/step - loss: 1.4517
Epoch 3/50
504/504 [=====] - 0s 217us/step - loss: 1.2062
Epoch 4/50
504/504 [=====] - 0s 217us/step - loss: 1.0280
Epoch 5/50
504/504 [=====] - 0s 217us/step - loss: 0.8884
Epoch 6/50
504/504 [=====] - 0s 186us/step - loss: 0.7717
Epoch 7/50
504/504 [=====] - 0s 186us/step - loss: 0.6751
Epoch 8/50
504/504 [=====] - 0s 186us/step - loss: 0.5930
Epoch 9/50
504/504 [=====] - 0s 248us/step - loss: 0.5300
Epoch 10/50
504/504 [=====] - 0s 217us/step - loss: 0.4819
Epoch 11/50
504/504 [=====] - 0s 217us/step - loss: 0.4419
Epoch 12/50
504/504 [=====] - 0s 186us/step - loss: 0.4098
Epoch 13/50
504/504 [=====] - 0s 186us/step - loss: 0.3858
Epoch 14/50
504/504 [=====] - 0s 217us/step - loss: 0.3662
Epoch 15/50
504/504 [=====] - 0s 186us/step - loss: 0.3448
Epoch 16/50
504/504 [=====] - 0s 217us/step - loss: 0.3287
Epoch 17/50
504/504 [=====] - 0s 217us/step - loss: 0.3150
Epoch 18/50
504/504 [=====] - 0s 217us/step - loss: 0.3042
Epoch 19/50
504/504 [=====] - 0s 186us/step - loss: 0.2920
Epoch 20/50
504/504 [=====] - 0s 186us/step - loss: 0.2830

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Epoch 21/50  
504/504 [=====] - 0s 248us/step - loss: 0.2740  
Epoch 22/50  
504/504 [=====] - 0s 186us/step - loss: 0.2675  
Epoch 23/50  
504/504 [=====] - 0s 186us/step - loss: 0.2611  
Epoch 24/50  
504/504 [=====] - 0s 186us/step - loss: 0.2564  
Epoch 25/50  
504/504 [=====] - 0s 217us/step - loss: 0.2502  
Epoch 26/50  
504/504 [=====] - 0s 217us/step - loss: 0.2453  
Epoch 27/50  
504/504 [=====] - 0s 217us/step - loss: 0.2411  
Epoch 28/50  
504/504 [=====] - 0s 186us/step - loss: 0.2382  
Epoch 29/50  
504/504 [=====] - 0s 186us/step - loss: 0.2330  
Epoch 30/50  
504/504 [=====] - 0s 217us/step - loss: 0.2282  
Epoch 31/50  
504/504 [=====] - 0s 217us/step - loss: 0.2248  
Epoch 32/50  
504/504 [=====] - 0s 186us/step - loss: 0.2212  
Epoch 33/50  
504/504 [=====] - 0s 248us/step - loss: 0.2178  
Epoch 34/50  
504/504 [=====] - 0s 217us/step - loss: 0.2159  
Epoch 35/50  
504/504 [=====] - 0s 217us/step - loss: 0.2136  
Epoch 36/50  
504/504 [=====] - 0s 217us/step - loss: 0.2094  
Epoch 37/50  
504/504 [=====] - 0s 217us/step - loss: 0.2067  
Epoch 38/50  
504/504 [=====] - 0s 186us/step - loss: 0.2034  
Epoch 39/50  
504/504 [=====] - 0s 186us/step - loss: 0.2009  
Epoch 40/50  
504/504 [=====] - 0s 217us/step - loss: 0.1972  
Epoch 41/50  
504/504 [=====] - 0s 217us/step - loss: 0.1954  
Epoch 42/50  
504/504 [=====] - 0s 217us/step - loss: 0.1913  
Epoch 43/50  
504/504 [=====] - 0s 217us/step - loss: 0.1891  
Epoch 44/50  
504/504 [=====] - 0s 217us/step - loss: 0.1860

Epoch 45/50  
504/504 [=====] - 0s 217us/step - loss: 0.1834  
Epoch 46/50  
504/504 [=====] - 0s 217us/step - loss: 0.1813  
Epoch 47/50  
504/504 [=====] - 0s 217us/step - loss: 0.1779  
Epoch 48/50  
504/504 [=====] - 0s 217us/step - loss: 0.1763  
Epoch 49/50  
504/504 [=====] - 0s 186us/step - loss: 0.1737  
Epoch 50/50  
504/504 [=====] - 0s 186us/step - loss: 0.1718  
Epoch 1/50  
504/504 [=====] - 8s 16ms/step - loss: 1.1592  
Epoch 2/50  
504/504 [=====] - 0s 187us/step - loss: 0.9993  
Epoch 3/50  
504/504 [=====] - 0s 217us/step - loss: 0.8888  
Epoch 4/50  
504/504 [=====] - 0s 155us/step - loss: 0.8038  
Epoch 5/50  
504/504 [=====] - 0s 186us/step - loss: 0.7270  
Epoch 6/50  
504/504 [=====] - 0s 248us/step - loss: 0.6629  
Epoch 7/50  
504/504 [=====] - 0s 186us/step - loss: 0.6070  
Epoch 8/50  
504/504 [=====] - 0s 248us/step - loss: 0.5538  
Epoch 9/50  
504/504 [=====] - 0s 186us/step - loss: 0.5062  
Epoch 10/50  
504/504 [=====] - 0s 248us/step - loss: 0.4664  
Epoch 11/50  
504/504 [=====] - 0s 217us/step - loss: 0.4376  
Epoch 12/50  
504/504 [=====] - 0s 186us/step - loss: 0.4143  
Epoch 13/50  
504/504 [=====] - 0s 186us/step - loss: 0.3941  
Epoch 14/50  
504/504 [=====] - 0s 186us/step - loss: 0.3768  
Epoch 15/50  
504/504 [=====] - 0s 155us/step - loss: 0.3622  
Epoch 16/50  
504/504 [=====] - 0s 155us/step - loss: 0.3499  
Epoch 17/50  
504/504 [=====] - 0s 186us/step - loss: 0.3381  
Epoch 18/50  
504/504 [=====] - 0s 155us/step - loss: 0.3259

Epoch 19/50  
504/504 [=====] - 0s 186us/step - loss: 0.3143  
Epoch 20/50  
504/504 [=====] - 0s 155us/step - loss: 0.3039  
Epoch 21/50  
504/504 [=====] - 0s 155us/step - loss: 0.2950  
Epoch 22/50  
504/504 [=====] - 0s 186us/step - loss: 0.2844  
Epoch 23/50  
504/504 [=====] - 0s 155us/step - loss: 0.2791  
Epoch 24/50  
504/504 [=====] - 0s 186us/step - loss: 0.2690  
Epoch 25/50  
504/504 [=====] - 0s 155us/step - loss: 0.2610  
Epoch 26/50  
504/504 [=====] - 0s 155us/step - loss: 0.2564  
Epoch 27/50  
504/504 [=====] - 0s 186us/step - loss: 0.2491  
Epoch 28/50  
504/504 [=====] - 0s 155us/step - loss: 0.2462  
Epoch 29/50  
504/504 [=====] - 0s 155us/step - loss: 0.2410  
Epoch 30/50  
504/504 [=====] - 0s 186us/step - loss: 0.2369  
Epoch 31/50  
504/504 [=====] - 0s 155us/step - loss: 0.2320  
Epoch 32/50  
504/504 [=====] - 0s 155us/step - loss: 0.2289  
Epoch 33/50  
504/504 [=====] - 0s 155us/step - loss: 0.2246  
Epoch 34/50  
504/504 [=====] - 0s 155us/step - loss: 0.2211  
Epoch 35/50  
504/504 [=====] - 0s 155us/step - loss: 0.2201  
Epoch 36/50  
504/504 [=====] - 0s 186us/step - loss: 0.2144  
Epoch 37/50  
504/504 [=====] - 0s 155us/step - loss: 0.2124  
Epoch 38/50  
504/504 [=====] - 0s 155us/step - loss: 0.2110  
Epoch 39/50  
504/504 [=====] - 0s 155us/step - loss: 0.2101  
Epoch 40/50  
504/504 [=====] - 0s 155us/step - loss: 0.2046  
Epoch 41/50  
504/504 [=====] - 0s 155us/step - loss: 0.2031  
Epoch 42/50  
504/504 [=====] - 0s 186us/step - loss: 0.2006

Epoch 43/50  
504/504 [=====] - 0s 155us/step - loss: 0.1976  
Epoch 44/50  
504/504 [=====] - 0s 155us/step - loss: 0.1979  
Epoch 45/50  
504/504 [=====] - 0s 155us/step - loss: 0.1947  
Epoch 46/50  
504/504 [=====] - 0s 155us/step - loss: 0.1916  
Epoch 47/50  
504/504 [=====] - 0s 155us/step - loss: 0.1893  
Epoch 48/50  
504/504 [=====] - 0s 186us/step - loss: 0.1850  
Epoch 49/50  
504/504 [=====] - 0s 155us/step - loss: 0.1828  
Epoch 50/50  
504/504 [=====] - 0s 155us/step - loss: 0.1804  
Epoch 1/50  
504/504 [=====] - 8s 16ms/step - loss: 1.5167  
Epoch 2/50  
504/504 [=====] - 0s 217us/step - loss: 1.2100  
Epoch 3/50  
504/504 [=====] - 0s 155us/step - loss: 1.0467  
Epoch 4/50  
504/504 [=====] - 0s 186us/step - loss: 0.9320  
Epoch 5/50  
504/504 [=====] - 0s 186us/step - loss: 0.8602  
Epoch 6/50  
504/504 [=====] - 0s 217us/step - loss: 0.7977  
Epoch 7/50  
504/504 [=====] - 0s 217us/step - loss: 0.7436  
Epoch 8/50  
504/504 [=====] - 0s 217us/step - loss: 0.6928  
Epoch 9/50  
504/504 [=====] - 0s 217us/step - loss: 0.6447  
Epoch 10/50  
504/504 [=====] - 0s 217us/step - loss: 0.5973  
Epoch 11/50  
504/504 [=====] - 0s 186us/step - loss: 0.5541  
Epoch 12/50  
504/504 [=====] - 0s 186us/step - loss: 0.5102  
Epoch 13/50  
504/504 [=====] - 0s 155us/step - loss: 0.4675  
Epoch 14/50  
504/504 [=====] - 0s 186us/step - loss: 0.4242  
Epoch 15/50  
504/504 [=====] - 0s 155us/step - loss: 0.3941  
Epoch 16/50  
504/504 [=====] - 0s 186us/step - loss: 0.3671

Epoch 17/50  
504/504 [=====] - 0s 186us/step - loss: 0.3485  
Epoch 18/50  
504/504 [=====] - 0s 186us/step - loss: 0.3347  
Epoch 19/50  
504/504 [=====] - 0s 186us/step - loss: 0.3198  
Epoch 20/50  
504/504 [=====] - 0s 217us/step - loss: 0.3071  
Epoch 21/50  
504/504 [=====] - 0s 248us/step - loss: 0.2964  
Epoch 22/50  
504/504 [=====] - 0s 186us/step - loss: 0.2862  
Epoch 23/50  
504/504 [=====] - 0s 186us/step - loss: 0.2756  
Epoch 24/50  
504/504 [=====] - 0s 186us/step - loss: 0.2686  
Epoch 25/50  
504/504 [=====] - 0s 186us/step - loss: 0.2603  
Epoch 26/50  
504/504 [=====] - 0s 186us/step - loss: 0.2544  
Epoch 27/50  
504/504 [=====] - 0s 186us/step - loss: 0.2487  
Epoch 28/50  
504/504 [=====] - 0s 155us/step - loss: 0.2430  
Epoch 29/50  
504/504 [=====] - 0s 155us/step - loss: 0.2399  
Epoch 30/50  
504/504 [=====] - 0s 217us/step - loss: 0.2352  
Epoch 31/50  
504/504 [=====] - 0s 186us/step - loss: 0.2310  
Epoch 32/50  
504/504 [=====] - 0s 186us/step - loss: 0.2269  
Epoch 33/50  
504/504 [=====] - 0s 155us/step - loss: 0.2247  
Epoch 34/50  
504/504 [=====] - 0s 186us/step - loss: 0.2196  
Epoch 35/50  
504/504 [=====] - 0s 248us/step - loss: 0.2192  
Epoch 36/50  
504/504 [=====] - 0s 248us/step - loss: 0.2168  
Epoch 37/50  
504/504 [=====] - 0s 186us/step - loss: 0.2113  
Epoch 38/50  
504/504 [=====] - 0s 155us/step - loss: 0.2093  
Epoch 39/50  
504/504 [=====] - 0s 186us/step - loss: 0.2046  
Epoch 40/50  
504/504 [=====] - 0s 217us/step - loss: 0.2034

Epoch 41/50  
504/504 [=====] - 0s 217us/step - loss: 0.2015  
Epoch 42/50  
504/504 [=====] - 0s 186us/step - loss: 0.1979  
Epoch 43/50  
504/504 [=====] - 0s 186us/step - loss: 0.1973  
Epoch 44/50  
504/504 [=====] - 0s 155us/step - loss: 0.1929  
Epoch 45/50  
504/504 [=====] - 0s 186us/step - loss: 0.1904  
Epoch 46/50  
504/504 [=====] - 0s 186us/step - loss: 0.1875  
Epoch 47/50  
504/504 [=====] - 0s 186us/step - loss: 0.1862  
Epoch 48/50  
504/504 [=====] - 0s 155us/step - loss: 0.1836  
Epoch 49/50  
504/504 [=====] - 0s 186us/step - loss: 0.1819  
Epoch 50/50  
504/504 [=====] - 0s 155us/step - loss: 0.1799  
Epoch 1/50  
504/504 [=====] - 8s 17ms/step - loss: 1.0576  
Epoch 2/50  
504/504 [=====] - 0s 279us/step - loss: 0.9809  
Epoch 3/50  
504/504 [=====] - 0s 186us/step - loss: 0.9319  
Epoch 4/50  
504/504 [=====] - 0s 186us/step - loss: 0.8948  
Epoch 5/50  
504/504 [=====] - 0s 186us/step - loss: 0.8581  
Epoch 6/50  
504/504 [=====] - 0s 217us/step - loss: 0.8119  
Epoch 7/50  
504/504 [=====] - 0s 217us/step - loss: 0.7627  
Epoch 8/50  
504/504 [=====] - 0s 248us/step - loss: 0.7104  
Epoch 9/50  
504/504 [=====] - 0s 295us/step - loss: 0.6523  
Epoch 10/50  
504/504 [=====] - 0s 269us/step - loss: 0.5939  
Epoch 11/50  
504/504 [=====] - 0s 287us/step - loss: 0.5366  
Epoch 12/50  
504/504 [=====] - 0s 248us/step - loss: 0.4865  
Epoch 13/50  
504/504 [=====] - 0s 248us/step - loss: 0.4464  
Epoch 14/50  
504/504 [=====] - 0s 248us/step - loss: 0.4178

Epoch 15/50  
504/504 [=====] - 0s 301us/step - loss: 0.3959  
Epoch 16/50  
504/504 [=====] - 0s 193us/step - loss: 0.3763  
Epoch 17/50  
504/504 [=====] - 0s 186us/step - loss: 0.3624  
Epoch 18/50  
504/504 [=====] - 0s 248us/step - loss: 0.3488  
Epoch 19/50  
504/504 [=====] - 0s 248us/step - loss: 0.3342  
Epoch 20/50  
504/504 [=====] - 0s 217us/step - loss: 0.3253  
Epoch 21/50  
504/504 [=====] - 0s 186us/step - loss: 0.3157  
Epoch 22/50  
504/504 [=====] - 0s 186us/step - loss: 0.3053  
Epoch 23/50  
504/504 [=====] - 0s 186us/step - loss: 0.2972  
Epoch 24/50  
504/504 [=====] - 0s 217us/step - loss: 0.2899  
Epoch 25/50  
504/504 [=====] - 0s 217us/step - loss: 0.2841  
Epoch 26/50  
504/504 [=====] - 0s 186us/step - loss: 0.2768  
Epoch 27/50  
504/504 [=====] - 0s 217us/step - loss: 0.2702  
Epoch 28/50  
504/504 [=====] - 0s 186us/step - loss: 0.2653  
Epoch 29/50  
504/504 [=====] - 0s 217us/step - loss: 0.2582  
Epoch 30/50  
504/504 [=====] - 0s 186us/step - loss: 0.2522  
Epoch 31/50  
504/504 [=====] - 0s 186us/step - loss: 0.2468  
Epoch 32/50  
504/504 [=====] - 0s 217us/step - loss: 0.2425  
Epoch 33/50  
504/504 [=====] - 0s 186us/step - loss: 0.2359  
Epoch 34/50  
504/504 [=====] - 0s 186us/step - loss: 0.2306  
Epoch 35/50  
504/504 [=====] - 0s 186us/step - loss: 0.2266  
Epoch 36/50  
504/504 [=====] - 0s 186us/step - loss: 0.2217  
Epoch 37/50  
504/504 [=====] - 0s 186us/step - loss: 0.2178  
Epoch 38/50  
504/504 [=====] - 0s 186us/step - loss: 0.2125

Epoch 39/50  
504/504 [=====] - 0s 248us/step - loss: 0.2093  
Epoch 40/50  
504/504 [=====] - 0s 186us/step - loss: 0.2057  
Epoch 41/50  
504/504 [=====] - 0s 372us/step - loss: 0.2011  
Epoch 42/50  
504/504 [=====] - 0s 310us/step - loss: 0.1983  
Epoch 43/50  
504/504 [=====] - 0s 277us/step - loss: 0.1924  
Epoch 44/50  
504/504 [=====] - 0s 198us/step - loss: 0.1913  
Epoch 45/50  
504/504 [=====] - 0s 198us/step - loss: 0.1866  
Epoch 46/50  
504/504 [=====] - 0s 219us/step - loss: 0.1831  
Epoch 47/50  
504/504 [=====] - 0s 198us/step - loss: 0.1811  
Epoch 48/50  
504/504 [=====] - 0s 287us/step - loss: 0.1782  
Epoch 49/50  
504/504 [=====] - 0s 248us/step - loss: 0.1737  
Epoch 50/50  
504/504 [=====] - 0s 208us/step - loss: 0.1702  
Epoch 1/50  
504/504 [=====] - 10s 20ms/step - loss: 1.5071  
Epoch 2/50  
504/504 [=====] - 0s 186us/step - loss: 1.2292  
Epoch 3/50  
504/504 [=====] - 0s 186us/step - loss: 1.0763  
Epoch 4/50  
504/504 [=====] - 0s 186us/step - loss: 0.9973  
Epoch 5/50  
504/504 [=====] - 0s 248us/step - loss: 0.9329  
Epoch 6/50  
504/504 [=====] - 0s 248us/step - loss: 0.8639  
Epoch 7/50  
504/504 [=====] - 0s 217us/step - loss: 0.7944  
Epoch 8/50  
504/504 [=====] - 0s 186us/step - loss: 0.7243  
Epoch 9/50  
504/504 [=====] - 0s 217us/step - loss: 0.6425  
Epoch 10/50  
504/504 [=====] - 0s 217us/step - loss: 0.5666  
Epoch 11/50  
504/504 [=====] - 0s 266us/step - loss: 0.5011  
Epoch 12/50  
504/504 [=====] - 0s 277us/step - loss: 0.4506



Epoch 13/50  
504/504 [=====] - 0s 209us/step - loss: 0.4162  
Epoch 14/50  
504/504 [=====] - 0s 250us/step - loss: 0.3880  
Epoch 15/50  
504/504 [=====] - 0s 222us/step - loss: 0.3704  
Epoch 16/50  
504/504 [=====] - 0s 186us/step - loss: 0.3526  
Epoch 17/50  
504/504 [=====] - 0s 155us/step - loss: 0.3376  
Epoch 18/50  
504/504 [=====] - 0s 186us/step - loss: 0.3226  
Epoch 19/50  
504/504 [=====] - 0s 248us/step - loss: 0.3109  
Epoch 20/50  
504/504 [=====] - 0s 217us/step - loss: 0.2986  
Epoch 21/50  
504/504 [=====] - 0s 186us/step - loss: 0.2889  
Epoch 22/50  
504/504 [=====] - 0s 248us/step - loss: 0.2784  
Epoch 23/50  
504/504 [=====] - 0s 217us/step - loss: 0.2697  
Epoch 24/50  
504/504 [=====] - 0s 217us/step - loss: 0.2606  
Epoch 25/50  
504/504 [=====] - 0s 186us/step - loss: 0.2516  
Epoch 26/50  
504/504 [=====] - 0s 217us/step - loss: 0.2456  
Epoch 27/50  
504/504 [=====] - 0s 186us/step - loss: 0.2369  
Epoch 28/50  
504/504 [=====] - 0s 217us/step - loss: 0.2302  
Epoch 29/50  
504/504 [=====] - 0s 186us/step - loss: 0.2228  
Epoch 30/50  
504/504 [=====] - 0s 217us/step - loss: 0.2169  
Epoch 31/50  
504/504 [=====] - 0s 186us/step - loss: 0.2134  
Epoch 32/50  
504/504 [=====] - 0s 217us/step - loss: 0.2089  
Epoch 33/50  
504/504 [=====] - 0s 186us/step - loss: 0.2024  
Epoch 34/50  
504/504 [=====] - 0s 217us/step - loss: 0.1989  
Epoch 35/50  
504/504 [=====] - 0s 217us/step - loss: 0.1921  
Epoch 36/50  
504/504 [=====] - 0s 186us/step - loss: 0.1863

Epoch 37/50  
504/504 [=====] - 0s 217us/step - loss: 0.1841  
Epoch 38/50  
504/504 [=====] - 0s 186us/step - loss: 0.1797  
Epoch 39/50  
504/504 [=====] - 0s 186us/step - loss: 0.1741  
Epoch 40/50  
504/504 [=====] - 0s 186us/step - loss: 0.1698  
Epoch 41/50  
504/504 [=====] - 0s 217us/step - loss: 0.1648  
Epoch 42/50  
504/504 [=====] - 0s 372us/step - loss: 0.1614  
Epoch 43/50  
504/504 [=====] - 0s 248us/step - loss: 0.1569  
Epoch 44/50  
504/504 [=====] - 0s 207us/step - loss: 0.1546  
Epoch 45/50  
504/504 [=====] - 0s 240us/step - loss: 0.1544  
Epoch 46/50  
504/504 [=====] - 0s 236us/step - loss: 0.1508  
Epoch 47/50  
504/504 [=====] - 0s 237us/step - loss: 0.1488  
Epoch 48/50  
504/504 [=====] - 0s 278us/step - loss: 0.1467  
Epoch 49/50  
504/504 [=====] - 0s 298us/step - loss: 0.1452  
Epoch 50/50  
504/504 [=====] - 0s 218us/step - loss: 0.1444  
Epoch 1/50  
504/504 [=====] - 10s 20ms/step - loss: 1.2486  
Epoch 2/50  
504/504 [=====] - 0s 238us/step - loss: 1.0265  
Epoch 3/50  
504/504 [=====] - 0s 208us/step - loss: 0.8845  
Epoch 4/50  
504/504 [=====] - 0s 228us/step - loss: 0.7940  
Epoch 5/50  
504/504 [=====] - 0s 328us/step - loss: 0.7272  
Epoch 6/50  
504/504 [=====] - 0s 316us/step - loss: 0.6748  
Epoch 7/50  
504/504 [=====] - 0s 310us/step - loss: 0.6222  
Epoch 8/50  
504/504 [=====] - 0s 217us/step - loss: 0.5763  
Epoch 9/50  
504/504 [=====] - 0s 217us/step - loss: 0.5329  
Epoch 10/50  
504/504 [=====] - 0s 279us/step - loss: 0.4939

Epoch 11/50  
504/504 [=====] - 0s 310us/step - loss: 0.4592  
Epoch 12/50  
504/504 [=====] - 0s 310us/step - loss: 0.4318  
Epoch 13/50  
504/504 [=====] - 0s 248us/step - loss: 0.4121  
Epoch 14/50  
504/504 [=====] - 0s 248us/step - loss: 0.3958  
Epoch 15/50  
504/504 [=====] - 0s 186us/step - loss: 0.3876  
Epoch 16/50  
504/504 [=====] - 0s 217us/step - loss: 0.3759  
Epoch 17/50  
504/504 [=====] - 0s 155us/step - loss: 0.3665  
Epoch 18/50  
504/504 [=====] - 0s 186us/step - loss: 0.3600  
Epoch 19/50  
504/504 [=====] - 0s 186us/step - loss: 0.3531  
Epoch 20/50  
504/504 [=====] - 0s 217us/step - loss: 0.3449  
Epoch 21/50  
504/504 [=====] - 0s 186us/step - loss: 0.3374  
Epoch 22/50  
504/504 [=====] - 0s 217us/step - loss: 0.3307  
Epoch 23/50  
504/504 [=====] - 0s 217us/step - loss: 0.3261  
Epoch 24/50  
504/504 [=====] - 0s 217us/step - loss: 0.3201  
Epoch 25/50  
504/504 [=====] - 0s 217us/step - loss: 0.3135  
Epoch 26/50  
504/504 [=====] - 0s 217us/step - loss: 0.3091  
Epoch 27/50  
504/504 [=====] - 0s 261us/step - loss: 0.3034  
Epoch 28/50  
504/504 [=====] - 0s 253us/step - loss: 0.2978  
Epoch 29/50  
504/504 [=====] - 0s 258us/step - loss: 0.2930  
Epoch 30/50  
504/504 [=====] - 0s 298us/step - loss: 0.2879  
Epoch 31/50  
504/504 [=====] - 0s 217us/step - loss: 0.2814  
Epoch 32/50  
504/504 [=====] - 0s 247us/step - loss: 0.2759  
Epoch 33/50  
504/504 [=====] - 0s 224us/step - loss: 0.2705  
Epoch 34/50  
504/504 [=====] - 0s 186us/step - loss: 0.2712

Epoch 35/50  
504/504 [=====] - 0s 186us/step - loss: 0.2609  
Epoch 36/50  
504/504 [=====] - 0s 186us/step - loss: 0.2566  
Epoch 37/50  
504/504 [=====] - 0s 217us/step - loss: 0.2525  
Epoch 38/50  
504/504 [=====] - 0s 186us/step - loss: 0.2466  
Epoch 39/50  
504/504 [=====] - 0s 217us/step - loss: 0.2405  
Epoch 40/50  
504/504 [=====] - 0s 186us/step - loss: 0.2360  
Epoch 41/50  
504/504 [=====] - 0s 217us/step - loss: 0.2305  
Epoch 42/50  
504/504 [=====] - 0s 186us/step - loss: 0.2259  
Epoch 43/50  
504/504 [=====] - 0s 217us/step - loss: 0.2210  
Epoch 44/50  
504/504 [=====] - 0s 186us/step - loss: 0.2153  
Epoch 45/50  
504/504 [=====] - 0s 186us/step - loss: 0.2107  
Epoch 46/50  
504/504 [=====] - 0s 186us/step - loss: 0.2061  
Epoch 47/50  
504/504 [=====] - 0s 186us/step - loss: 0.2039  
Epoch 48/50  
504/504 [=====] - 0s 186us/step - loss: 0.1991  
Epoch 49/50  
504/504 [=====] - 0s 217us/step - loss: 0.1948  
Epoch 50/50  
504/504 [=====] - 0s 186us/step - loss: 0.1892  
Epoch 1/50  
504/504 [=====] - 10s 20ms/step - loss: 1.0513  
Epoch 2/50  
504/504 [=====] - 0s 238us/step - loss: 0.9572  
Epoch 3/50  
504/504 [=====] - 0s 228us/step - loss: 0.8890  
Epoch 4/50  
504/504 [=====] - 0s 284us/step - loss: 0.8324  
Epoch 5/50  
504/504 [=====] - 0s 292us/step - loss: 0.7731  
Epoch 6/50  
504/504 [=====] - 0s 217us/step - loss: 0.7143  
Epoch 7/50  
504/504 [=====] - 0s 186us/step - loss: 0.6565  
Epoch 8/50  
504/504 [=====] - 0s 217us/step - loss: 0.6048

Epoch 9/50  
504/504 [=====] - 0s 310us/step - loss: 0.5585  
Epoch 10/50  
504/504 [=====] - 0s 341us/step - loss: 0.5225  
Epoch 11/50  
504/504 [=====] - 0s 341us/step - loss: 0.4882  
Epoch 12/50  
504/504 [=====] - 0s 248us/step - loss: 0.4613  
Epoch 13/50  
504/504 [=====] - 0s 217us/step - loss: 0.4371  
Epoch 14/50  
504/504 [=====] - 0s 341us/step - loss: 0.4143  
Epoch 15/50  
504/504 [=====] - 0s 239us/step - loss: 0.3939  
Epoch 16/50  
504/504 [=====] - 0s 219us/step - loss: 0.3805  
Epoch 17/50  
504/504 [=====] - 0s 238us/step - loss: 0.3649  
Epoch 18/50  
504/504 [=====] - 0s 239us/step - loss: 0.3536  
Epoch 19/50  
504/504 [=====] - 0s 267us/step - loss: 0.3397  
Epoch 20/50  
504/504 [=====] - 0s 268us/step - loss: 0.3267  
Epoch 21/50  
504/504 [=====] - 0s 248us/step - loss: 0.3162  
Epoch 22/50  
504/504 [=====] - 0s 239us/step - loss: 0.3060  
Epoch 23/50  
504/504 [=====] - 0s 228us/step - loss: 0.2979  
Epoch 24/50  
504/504 [=====] - 0s 259us/step - loss: 0.2887  
Epoch 25/50  
504/504 [=====] - 0s 248us/step - loss: 0.2827  
Epoch 26/50  
504/504 [=====] - 0s 257us/step - loss: 0.2733  
Epoch 27/50  
504/504 [=====] - 0s 239us/step - loss: 0.2663  
Epoch 28/50  
504/504 [=====] - 0s 278us/step - loss: 0.2619  
Epoch 29/50  
504/504 [=====] - 0s 212us/step - loss: 0.2534  
Epoch 30/50  
504/504 [=====] - 0s 234us/step - loss: 0.2469  
Epoch 31/50  
504/504 [=====] - 0s 225us/step - loss: 0.2380  
Epoch 32/50  
504/504 [=====] - 0s 403us/step - loss: 0.2306

Epoch 33/50  
504/504 [=====] - 0s 280us/step - loss: 0.2261  
Epoch 34/50  
504/504 [=====] - 0s 247us/step - loss: 0.2177  
Epoch 35/50  
504/504 [=====] - 0s 218us/step - loss: 0.2116  
Epoch 36/50  
504/504 [=====] - 0s 209us/step - loss: 0.2085  
Epoch 37/50  
504/504 [=====] - 0s 199us/step - loss: 0.2027  
Epoch 38/50  
504/504 [=====] - 0s 199us/step - loss: 0.1979  
Epoch 39/50  
504/504 [=====] - 0s 228us/step - loss: 0.1943  
Epoch 40/50  
504/504 [=====] - 0s 298us/step - loss: 0.1913  
Epoch 41/50  
504/504 [=====] - 0s 209us/step - loss: 0.1859  
Epoch 42/50  
504/504 [=====] - 0s 218us/step - loss: 0.1838  
Epoch 43/50  
504/504 [=====] - 0s 219us/step - loss: 0.1816  
Epoch 44/50  
504/504 [=====] - 0s 258us/step - loss: 0.1786  
Epoch 45/50  
504/504 [=====] - 0s 278us/step - loss: 0.1749  
Epoch 46/50  
504/504 [=====] - 0s 208us/step - loss: 0.1720  
Epoch 47/50  
504/504 [=====] - 0s 218us/step - loss: 0.1699  
Epoch 48/50  
504/504 [=====] - 0s 218us/step - loss: 0.1681  
Epoch 49/50  
504/504 [=====] - 0s 218us/step - loss: 0.1655  
Epoch 50/50  
504/504 [=====] - 0s 226us/step - loss: 0.1629  
Epoch 1/50  
504/504 [=====] - 9s 17ms/step - loss: 1.2037  
Epoch 2/50  
504/504 [=====] - 0s 186us/step - loss: 1.0394  
Epoch 3/50  
504/504 [=====] - 0s 217us/step - loss: 0.9410  
Epoch 4/50  
504/504 [=====] - 0s 217us/step - loss: 0.8639  
Epoch 5/50  
504/504 [=====] - 0s 217us/step - loss: 0.7967  
Epoch 6/50  
504/504 [=====] - 0s 217us/step - loss: 0.7355

Epoch 7/50  
504/504 [=====] - 0s 217us/step - loss: 0.6792  
Epoch 8/50  
504/504 [=====] - 0s 248us/step - loss: 0.6255  
Epoch 9/50  
504/504 [=====] - 0s 248us/step - loss: 0.5753  
Epoch 10/50  
504/504 [=====] - 0s 217us/step - loss: 0.5292  
Epoch 11/50  
504/504 [=====] - 0s 217us/step - loss: 0.4907  
Epoch 12/50  
504/504 [=====] - 0s 249us/step - loss: 0.4540  
Epoch 13/50  
504/504 [=====] - 0s 248us/step - loss: 0.4220  
Epoch 14/50  
504/504 [=====] - 0s 248us/step - loss: 0.3922  
Epoch 15/50  
504/504 [=====] - 0s 217us/step - loss: 0.3677  
Epoch 16/50  
504/504 [=====] - 0s 217us/step - loss: 0.3478  
Epoch 17/50  
504/504 [=====] - 0s 248us/step - loss: 0.3330  
Epoch 18/50  
504/504 [=====] - 0s 217us/step - loss: 0.3187  
Epoch 19/50  
504/504 [=====] - 0s 248us/step - loss: 0.3060  
Epoch 20/50  
504/504 [=====] - 0s 217us/step - loss: 0.2971  
Epoch 21/50  
504/504 [=====] - 0s 279us/step - loss: 0.2881  
Epoch 22/50  
504/504 [=====] - 0s 248us/step - loss: 0.2800  
Epoch 23/50  
504/504 [=====] - 0s 217us/step - loss: 0.2728  
Epoch 24/50  
504/504 [=====] - 0s 341us/step - loss: 0.2654  
Epoch 25/50  
504/504 [=====] - 0s 279us/step - loss: 0.2584  
Epoch 26/50  
504/504 [=====] - 0s 217us/step - loss: 0.2529  
Epoch 27/50  
504/504 [=====] - 0s 248us/step - loss: 0.2464  
Epoch 28/50  
504/504 [=====] - 0s 217us/step - loss: 0.2412  
Epoch 29/50  
504/504 [=====] - 0s 217us/step - loss: 0.2374  
Epoch 30/50  
504/504 [=====] - 0s 217us/step - loss: 0.2336

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Epoch 31/50
504/504 [=====] - 0s 217us/step - loss: 0.2266
Epoch 32/50
504/504 [=====] - 0s 217us/step - loss: 0.2217
Epoch 33/50
504/504 [=====] - 0s 217us/step - loss: 0.2161
Epoch 34/50
504/504 [=====] - 0s 217us/step - loss: 0.2119
Epoch 35/50
504/504 [=====] - 0s 217us/step - loss: 0.2080
Epoch 36/50
504/504 [=====] - 0s 186us/step - loss: 0.2038
Epoch 37/50
504/504 [=====] - 0s 218us/step - loss: 0.2003
Epoch 38/50
504/504 [=====] - 0s 186us/step - loss: 0.1975
Epoch 39/50
504/504 [=====] - 0s 186us/step - loss: 0.1964
Epoch 40/50
504/504 [=====] - 0s 186us/step - loss: 0.1933
Epoch 41/50
504/504 [=====] - 0s 217us/step - loss: 0.1894
Epoch 42/50
504/504 [=====] - 0s 186us/step - loss: 0.1865
Epoch 43/50
504/504 [=====] - 0s 279us/step - loss: 0.1848
Epoch 44/50
504/504 [=====] - 0s 186us/step - loss: 0.1814
Epoch 45/50
504/504 [=====] - 0s 248us/step - loss: 0.1788
Epoch 46/50
504/504 [=====] - 0s 186us/step - loss: 0.1763
Epoch 47/50
504/504 [=====] - 0s 310us/step - loss: 0.1743
Epoch 48/50
504/504 [=====] - 0s 279us/step - loss: 0.1715
Epoch 49/50
504/504 [=====] - 0s 217us/step - loss: 0.1685
Epoch 50/50
504/504 [=====] - 0s 310us/step - loss: 0.1659
Epoch 1/50
504/504 [=====] - 11s 22ms/step - loss: 0.9291
Epoch 2/50
504/504 [=====] - 0s 257us/step - loss: 0.8961
Epoch 3/50
504/504 [=====] - 0s 269us/step - loss: 0.8632
Epoch 4/50
504/504 [=====] - 0s 287us/step - loss: 0.8272

```



Epoch 5/50  
504/504 [=====] - 0s 258us/step - loss: 0.7782  
Epoch 6/50  
504/504 [=====] - 0s 249us/step - loss: 0.7193  
Epoch 7/50  
504/504 [=====] - 0s 259us/step - loss: 0.6515  
Epoch 8/50  
504/504 [=====] - 0s 277us/step - loss: 0.5810  
Epoch 9/50  
504/504 [=====] - 0s 268us/step - loss: 0.5303  
Epoch 10/50  
504/504 [=====] - 0s 278us/step - loss: 0.4893  
Epoch 11/50  
504/504 [=====] - 0s 258us/step - loss: 0.4615  
Epoch 12/50  
504/504 [=====] - 0s 278us/step - loss: 0.4351  
Epoch 13/50  
504/504 [=====] - 0s 288us/step - loss: 0.4160  
Epoch 14/50  
504/504 [=====] - 0s 268us/step - loss: 0.4008  
Epoch 15/50  
504/504 [=====] - 0s 239us/step - loss: 0.3805  
Epoch 16/50  
504/504 [=====] - 0s 258us/step - loss: 0.3667  
Epoch 17/50  
504/504 [=====] - 0s 237us/step - loss: 0.3572  
Epoch 18/50  
504/504 [=====] - 0s 238us/step - loss: 0.3498  
Epoch 19/50  
504/504 [=====] - 0s 238us/step - loss: 0.3366  
Epoch 20/50  
504/504 [=====] - 0s 248us/step - loss: 0.3274  
Epoch 21/50  
504/504 [=====] - 0s 208us/step - loss: 0.3207  
Epoch 22/50  
504/504 [=====] - 0s 218us/step - loss: 0.3117  
Epoch 23/50  
504/504 [=====] - 0s 219us/step - loss: 0.3051  
Epoch 24/50  
504/504 [=====] - 0s 218us/step - loss: 0.2968  
Epoch 25/50  
504/504 [=====] - 0s 219us/step - loss: 0.2913  
Epoch 26/50  
504/504 [=====] - 0s 218us/step - loss: 0.2848  
Epoch 27/50  
504/504 [=====] - 0s 248us/step - loss: 0.2797  
Epoch 28/50  
504/504 [=====] - 0s 238us/step - loss: 0.2743

Epoch 29/50  
504/504 [=====] - 0s 238us/step - loss: 0.2675  
Epoch 30/50  
504/504 [=====] - 0s 238us/step - loss: 0.2606  
Epoch 31/50  
504/504 [=====] - 0s 238us/step - loss: 0.2551  
Epoch 32/50  
504/504 [=====] - 0s 228us/step - loss: 0.2516  
Epoch 33/50  
504/504 [=====] - 0s 337us/step - loss: 0.2455  
Epoch 34/50  
504/504 [=====] - 0s 277us/step - loss: 0.2413  
Epoch 35/50  
504/504 [=====] - 0s 268us/step - loss: 0.2379  
Epoch 36/50  
504/504 [=====] - 0s 228us/step - loss: 0.2313  
Epoch 37/50  
504/504 [=====] - 0s 268us/step - loss: 0.2275  
Epoch 38/50  
504/504 [=====] - 0s 209us/step - loss: 0.2218  
Epoch 39/50  
504/504 [=====] - 0s 218us/step - loss: 0.2180  
Epoch 40/50  
504/504 [=====] - 0s 238us/step - loss: 0.2138  
Epoch 41/50  
504/504 [=====] - 0s 319us/step - loss: 0.2086  
Epoch 42/50  
504/504 [=====] - 0s 207us/step - loss: 0.2041  
Epoch 43/50  
504/504 [=====] - 0s 198us/step - loss: 0.2006  
Epoch 44/50  
504/504 [=====] - 0s 209us/step - loss: 0.1978  
Epoch 45/50  
504/504 [=====] - 0s 218us/step - loss: 0.1933  
Epoch 46/50  
504/504 [=====] - 0s 268us/step - loss: 0.1923  
Epoch 47/50  
504/504 [=====] - 0s 248us/step - loss: 0.1860  
Epoch 48/50  
504/504 [=====] - 0s 228us/step - loss: 0.1844  
Epoch 49/50  
504/504 [=====] - 0s 218us/step - loss: 0.1825  
Epoch 50/50  
504/504 [=====] - 0s 248us/step - loss: 0.1796  
Epoch 1/50  
504/504 [=====] - 10s 21ms/step - loss: 1.2839  
Epoch 2/50  
504/504 [=====] - 0s 186us/step - loss: 1.0916

Epoch 3/50  
504/504 [=====] - 0s 186us/step - loss: 1.0016  
Epoch 4/50  
504/504 [=====] - 0s 186us/step - loss: 0.9426  
Epoch 5/50  
504/504 [=====] - 0s 217us/step - loss: 0.8961  
Epoch 6/50  
504/504 [=====] - 0s 186us/step - loss: 0.8475  
Epoch 7/50  
504/504 [=====] - 0s 217us/step - loss: 0.7990  
Epoch 8/50  
504/504 [=====] - 0s 217us/step - loss: 0.7452  
Epoch 9/50  
504/504 [=====] - 0s 217us/step - loss: 0.6911  
Epoch 10/50  
504/504 [=====] - 0s 186us/step - loss: 0.6386  
Epoch 11/50  
504/504 [=====] - 0s 186us/step - loss: 0.5941  
Epoch 12/50  
504/504 [=====] - 0s 186us/step - loss: 0.5547  
Epoch 13/50  
504/504 [=====] - 0s 155us/step - loss: 0.5242  
Epoch 14/50  
504/504 [=====] - 0s 186us/step - loss: 0.4940  
Epoch 15/50  
504/504 [=====] - 0s 217us/step - loss: 0.4690  
Epoch 16/50  
504/504 [=====] - 0s 186us/step - loss: 0.4456  
Epoch 17/50  
504/504 [=====] - 0s 186us/step - loss: 0.4274  
Epoch 18/50  
504/504 [=====] - 0s 217us/step - loss: 0.4080  
Epoch 19/50  
504/504 [=====] - 0s 186us/step - loss: 0.3891  
Epoch 20/50  
504/504 [=====] - 0s 176us/step - loss: 0.3704  
Epoch 21/50  
504/504 [=====] - 0s 186us/step - loss: 0.3541  
Epoch 22/50  
504/504 [=====] - 0s 186us/step - loss: 0.3385  
Epoch 23/50  
504/504 [=====] - 0s 217us/step - loss: 0.3260  
Epoch 24/50  
504/504 [=====] - 0s 186us/step - loss: 0.3135  
Epoch 25/50  
504/504 [=====] - 0s 186us/step - loss: 0.2997  
Epoch 26/50  
504/504 [=====] - 0s 186us/step - loss: 0.2878

Epoch 27/50  
504/504 [=====] - 0s 186us/step - loss: 0.2780  
Epoch 28/50  
504/504 [=====] - 0s 155us/step - loss: 0.2664  
Epoch 29/50  
504/504 [=====] - 0s 186us/step - loss: 0.2569  
Epoch 30/50  
504/504 [=====] - 0s 186us/step - loss: 0.2499  
Epoch 31/50  
504/504 [=====] - 0s 186us/step - loss: 0.2400  
Epoch 32/50  
504/504 [=====] - 0s 155us/step - loss: 0.2348  
Epoch 33/50  
504/504 [=====] - 0s 186us/step - loss: 0.2280  
Epoch 34/50  
504/504 [=====] - 0s 186us/step - loss: 0.2241  
Epoch 35/50  
504/504 [=====] - 0s 186us/step - loss: 0.2181  
Epoch 36/50  
504/504 [=====] - 0s 217us/step - loss: 0.2122  
Epoch 37/50  
504/504 [=====] - 0s 186us/step - loss: 0.2095  
Epoch 38/50  
504/504 [=====] - 0s 217us/step - loss: 0.2038  
Epoch 39/50  
504/504 [=====] - 0s 279us/step - loss: 0.1995  
Epoch 40/50  
504/504 [=====] - 0s 217us/step - loss: 0.1956  
Epoch 41/50  
504/504 [=====] - 0s 217us/step - loss: 0.1931  
Epoch 42/50  
504/504 [=====] - 0s 217us/step - loss: 0.1901  
Epoch 43/50  
504/504 [=====] - 0s 248us/step - loss: 0.1876  
Epoch 44/50  
504/504 [=====] - 0s 279us/step - loss: 0.1847  
Epoch 45/50  
504/504 [=====] - 0s 248us/step - loss: 0.1818  
Epoch 46/50  
504/504 [=====] - 0s 248us/step - loss: 0.1805  
Epoch 47/50  
504/504 [=====] - 0s 248us/step - loss: 0.1771  
Epoch 48/50  
504/504 [=====] - 0s 279us/step - loss: 0.1763  
Epoch 49/50  
504/504 [=====] - 0s 248us/step - loss: 0.1745  
Epoch 50/50  
504/504 [=====] - 0s 248us/step - loss: 0.1731

Epoch 1/50  
504/504 [=====] - 9s 18ms/step - loss: 1.0442  
Epoch 2/50  
504/504 [=====] - 0s 217us/step - loss: 0.9749  
Epoch 3/50  
504/504 [=====] - 0s 186us/step - loss: 0.9230  
Epoch 4/50  
504/504 [=====] - 0s 217us/step - loss: 0.8772  
Epoch 5/50  
504/504 [=====] - 0s 217us/step - loss: 0.8249  
Epoch 6/50  
504/504 [=====] - 0s 248us/step - loss: 0.7716  
Epoch 7/50  
504/504 [=====] - 0s 286us/step - loss: 0.7136  
Epoch 8/50  
504/504 [=====] - 0s 248us/step - loss: 0.6517  
Epoch 9/50  
504/504 [=====] - 0s 219us/step - loss: 0.5914  
Epoch 10/50  
504/504 [=====] - 0s 287us/step - loss: 0.5395  
Epoch 11/50  
504/504 [=====] - 0s 258us/step - loss: 0.5056  
Epoch 12/50  
504/504 [=====] - 0s 278us/step - loss: 0.4776  
Epoch 13/50  
504/504 [=====] - 0s 297us/step - loss: 0.4562  
Epoch 14/50  
504/504 [=====] - 0s 288us/step - loss: 0.4385  
Epoch 15/50  
504/504 [=====] - 0s 338us/step - loss: 0.4221  
Epoch 16/50  
504/504 [=====] - 0s 298us/step - loss: 0.4073  
Epoch 17/50  
504/504 [=====] - 0s 258us/step - loss: 0.3933  
Epoch 18/50  
504/504 [=====] - 0s 248us/step - loss: 0.3797  
Epoch 19/50  
504/504 [=====] - 0s 238us/step - loss: 0.3671  
Epoch 20/50  
504/504 [=====] - 0s 310us/step - loss: 0.3562  
Epoch 21/50  
504/504 [=====] - 0s 305us/step - loss: 0.3459  
Epoch 22/50  
504/504 [=====] - 0s 288us/step - loss: 0.3369  
Epoch 23/50  
504/504 [=====] - 0s 228us/step - loss: 0.3268  
Epoch 24/50  
504/504 [=====] - 0s 228us/step - loss: 0.3166

Epoch 25/50  
504/504 [=====] - 0s 219us/step - loss: 0.3077  
Epoch 26/50  
504/504 [=====] - 0s 238us/step - loss: 0.2998  
Epoch 27/50  
504/504 [=====] - 0s 288us/step - loss: 0.2913  
Epoch 28/50  
504/504 [=====] - 0s 237us/step - loss: 0.2820  
Epoch 29/50  
504/504 [=====] - 0s 228us/step - loss: 0.2736  
Epoch 30/50  
504/504 [=====] - 0s 234us/step - loss: 0.2662  
Epoch 31/50  
504/504 [=====] - 0s 248us/step - loss: 0.2592  
Epoch 32/50  
504/504 [=====] - 0s 219us/step - loss: 0.2524  
Epoch 33/50  
504/504 [=====] - 0s 248us/step - loss: 0.2459  
Epoch 34/50  
504/504 [=====] - 0s 224us/step - loss: 0.2412  
Epoch 35/50  
504/504 [=====] - 0s 229us/step - loss: 0.2375  
Epoch 36/50  
504/504 [=====] - 0s 239us/step - loss: 0.2314  
Epoch 37/50  
504/504 [=====] - 0s 208us/step - loss: 0.2279  
Epoch 38/50  
504/504 [=====] - 0s 209us/step - loss: 0.2221  
Epoch 39/50  
504/504 [=====] - 0s 209us/step - loss: 0.2195  
Epoch 40/50  
504/504 [=====] - 0s 198us/step - loss: 0.2163  
Epoch 41/50  
504/504 [=====] - 0s 186us/step - loss: 0.2120  
Epoch 42/50  
504/504 [=====] - 0s 186us/step - loss: 0.2097  
Epoch 43/50  
504/504 [=====] - 0s 186us/step - loss: 0.2076  
Epoch 44/50  
504/504 [=====] - 0s 186us/step - loss: 0.2046  
Epoch 45/50  
504/504 [=====] - 0s 186us/step - loss: 0.2008  
Epoch 46/50  
504/504 [=====] - 0s 186us/step - loss: 0.1997  
Epoch 47/50  
504/504 [=====] - 0s 217us/step - loss: 0.1978  
Epoch 48/50  
504/504 [=====] - 0s 217us/step - loss: 0.1933

Epoch 49/50  
504/504 [=====] - 0s 217us/step - loss: 0.1904  
Epoch 50/50  
504/504 [=====] - 0s 217us/step - loss: 0.1886  
Epoch 1/50  
504/504 [=====] - 11s 21ms/step - loss: 1.3308  
Epoch 2/50  
504/504 [=====] - 0s 186us/step - loss: 1.1189  
Epoch 3/50  
504/504 [=====] - 0s 217us/step - loss: 1.0093  
Epoch 4/50  
504/504 [=====] - 0s 279us/step - loss: 0.9399  
Epoch 5/50  
504/504 [=====] - 0s 217us/step - loss: 0.8746  
Epoch 6/50  
504/504 [=====] - 0s 186us/step - loss: 0.8115  
Epoch 7/50  
504/504 [=====] - 0s 217us/step - loss: 0.7409  
Epoch 8/50  
504/504 [=====] - 0s 186us/step - loss: 0.6723  
Epoch 9/50  
504/504 [=====] - 0s 186us/step - loss: 0.6138  
Epoch 10/50  
504/504 [=====] - 0s 186us/step - loss: 0.5611  
Epoch 11/50  
504/504 [=====] - 0s 186us/step - loss: 0.5154  
Epoch 12/50  
504/504 [=====] - 0s 155us/step - loss: 0.4790  
Epoch 13/50  
504/504 [=====] - 0s 186us/step - loss: 0.4494  
Epoch 14/50  
504/504 [=====] - 0s 186us/step - loss: 0.4247  
Epoch 15/50  
504/504 [=====] - 0s 186us/step - loss: 0.4045  
Epoch 16/50  
504/504 [=====] - 0s 186us/step - loss: 0.3881  
Epoch 17/50  
504/504 [=====] - 0s 155us/step - loss: 0.3723  
Epoch 18/50  
504/504 [=====] - 0s 217us/step - loss: 0.3602  
Epoch 19/50  
504/504 [=====] - 0s 186us/step - loss: 0.3490  
Epoch 20/50  
504/504 [=====] - 0s 186us/step - loss: 0.3371  
Epoch 21/50  
504/504 [=====] - 0s 217us/step - loss: 0.3259  
Epoch 22/50  
504/504 [=====] - 0s 186us/step - loss: 0.3166

Epoch 23/50  
504/504 [=====] - 0s 186us/step - loss: 0.3067  
Epoch 24/50  
504/504 [=====] - 0s 186us/step - loss: 0.2994  
Epoch 25/50  
504/504 [=====] - 0s 186us/step - loss: 0.2939  
Epoch 26/50  
504/504 [=====] - 0s 217us/step - loss: 0.2880  
Epoch 27/50  
504/504 [=====] - 0s 186us/step - loss: 0.2819  
Epoch 28/50  
504/504 [=====] - 0s 248us/step - loss: 0.2762  
Epoch 29/50  
504/504 [=====] - 0s 217us/step - loss: 0.2714  
Epoch 30/50  
504/504 [=====] - 0s 186us/step - loss: 0.2671  
Epoch 31/50  
504/504 [=====] - 0s 217us/step - loss: 0.2623  
Epoch 32/50  
504/504 [=====] - 0s 217us/step - loss: 0.2577  
Epoch 33/50  
504/504 [=====] - 0s 217us/step - loss: 0.2520  
Epoch 34/50  
504/504 [=====] - 0s 186us/step - loss: 0.2463  
Epoch 35/50  
504/504 [=====] - 0s 155us/step - loss: 0.2414  
Epoch 36/50  
504/504 [=====] - 0s 217us/step - loss: 0.2363  
Epoch 37/50  
504/504 [=====] - 0s 186us/step - loss: 0.2305  
Epoch 38/50  
504/504 [=====] - 0s 186us/step - loss: 0.2252  
Epoch 39/50  
504/504 [=====] - 0s 186us/step - loss: 0.2192  
Epoch 40/50  
504/504 [=====] - 0s 155us/step - loss: 0.2137  
Epoch 41/50  
504/504 [=====] - 0s 186us/step - loss: 0.2082  
Epoch 42/50  
504/504 [=====] - 0s 186us/step - loss: 0.2060  
Epoch 43/50  
504/504 [=====] - 0s 217us/step - loss: 0.2007  
Epoch 44/50  
504/504 [=====] - 0s 186us/step - loss: 0.1953  
Epoch 45/50  
504/504 [=====] - 0s 186us/step - loss: 0.1915  
Epoch 46/50  
504/504 [=====] - 0s 186us/step - loss: 0.1876



```
Epoch 47/50
504/504 [=====] - 0s 217us/step - loss: 0.1841
Epoch 48/50
504/504 [=====] - 0s 217us/step - loss: 0.1820
Epoch 49/50
504/504 [=====] - 0s 217us/step - loss: 0.1789
Epoch 50/50
504/504 [=====] - 0s 248us/step - loss: 0.1753
```

```
[83]: print("A list of 50 Normalised mean squared errors using 50 epochs with 3_
      ↪hidden layers:", o)
```

```
A list of 50 Normalised mean squared errors using 50 epochs with 3 hidden
layers: [0.20106230374245845, 0.22242902799111516, 0.26228400553425574,
0.18513910060019373, 0.2143600607790405, 0.234072760134535, 0.21668895615538214,
0.19109190170043447, 0.2081022103092388, 0.24744944853619322,
0.21779227542334018, 0.21139551559449732, 0.22510198665201983,
0.19791896473612652, 0.2037999738963247, 0.15573068698310233,
0.24067351592249175, 0.23861480240976188, 0.21032562284881273,
0.267853551213388, 0.20294694044297482, 0.2801312638343425, 0.1744385731363488,
0.2554199298358612, 0.22369688984063904, 0.16649806830885097,
0.20001611978846018, 0.2224626473702785, 0.21077525686458345,
0.21541711794358084, 0.17988190815624772, 0.17699924246303786,
0.21299354981355145, 0.16946620743572077, 0.19854751055992875,
0.17812000082591503, 0.22936462604067656, 0.1545179749634449,
0.19843682187182232, 0.22404200593724982, 0.21784242438261456,
0.19409761248549404, 0.18950410898320713, 0.23911458160334587,
0.22074950228239928, 0.20326286291158754, 0.23679896767160127,
0.2114143419636653, 0.20448955614978845, 0.19527181481014316]
```

```
[84]: onew = scaler.inverse_transform(o)
```

```
[85]: onew
```

```
[85]: array([39.26750452, 39.63028783, 40.30698121, 38.99714617, 39.49328571,
39.82798551, 39.53282777, 39.09821814, 39.38703434, 40.05510686,
39.55156091, 39.44295102, 39.67567171, 39.21413411, 39.31398713,
38.49782388, 39.94005903, 39.90510435, 39.42478542, 40.40154592,
39.29950357, 40.61000788, 38.81546307, 40.1904368 , 39.65181472,
38.68064209, 39.24974148, 39.63085865, 39.43241971, 39.51123337,
38.90788487, 38.8589404 , 39.47008387, 38.73103781, 39.22480612,
38.87796963, 39.74804661, 38.47723338, 39.22292675, 39.65767441,
39.55241239, 39.14925178, 39.07125918, 39.91359005, 39.60177135,
39.30486758, 39.87427349, 39.44327067, 39.32569547, 39.16918844])
```

```
[86]: on = sum(onew)
```

```
[87]: on.mean()
```

[87]: 1971.6183071367636

How does the mean of the mean squared errors compare to that from Step B?

**Mean of mean square errors with 3 hidden layers is 1971.61 vs 2046.69 in step B. Additional hidden layers slightly reduced a bit of mean square error.**

THE END

[ ]: