Ноутбук для предсказания временной последовательности (дебита нефти за 17 лет) при помощи рекуррентной нейронной сети GRU

In [15]:
```
import sys
sys.path.append("../..")
import math

import tensorflow as tf
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
from pathlib import Path
import random
import tensorflow.keras as keras

from sklearn.metrics import mean_squared_error
from sklearn.metrics import mean_absolute_error
from sklearn.metrics import r2_score
from sklearn.model_selection import KFold
from sklearn.model_selection import train_test_split

from tqdm import tqdm, tqdm_notebook, trange

from tensorflow.keras.models import Sequential, Model
from tensorflow.keras.layers import Dropout, Dense, GRU
from sklearn.model_selection import train_test_split

from sklearn.preprocessing import MinMaxScaler
from sklearn.preprocessing import StandardScaler

from tensorflow.keras.callbacks import ModelCheckpoint

%matplotlib inline
import warnings
warnings.filterwarnings('ignore')

from typing import List
from typing import Tuple
from typing import Union
```

Для корректного теста работы сети необходимо задать "random seed"

In [16]:
```
random.seed(5)
tf.random.set_seed(5)
```

Определяем метрики, с помощью которых будем оценивать результаты работы сети

In [17]:
```
def mean_absolute_percentage_error(y_true, y_pred):
    y_true, y_pred = np.array(y_true).squeeze(), np.array(y_pred).squeeze()
    y_m = [y_true != 0]
    return np.mean(np.abs((y_true[y_m] - y_pred[y_m]) / y_true[y_m])) * 100

def median_mape(y_true, y_pred):
    y_true, y_pred = np.array(y_true).squeeze(), np.array(y_pred).squeeze()
    y_m = [y_true != 0]
    return np.median(np.abs((y_true[y_m] - y_pred[y_m]) / y_true[y_m])) * 100

def metrics_sum(y_true,y_predicted):
    R2_sum = r2_score(y_true.sum(axis=1), y_predicted.sum(axis=1))
    MAE_sum = mean_absolute_error(y_true.sum(axis=1), y_predicted.sum(axis=1))
    MSE_sum = mean_squared_error(y_true.sum(axis=1), y_predicted.sum(axis=1))
    MAPE_sum = mean_absolute_percentage_error(y_true.sum(axis=1), y_predicted.sum(axis=1))
    MMAPE_sum = median_mape(y_true.sum(axis=1), y_predicted.sum(axis=1))
    return R2_sum, MAE_sum, MSE_sum, MAPE_sum, MMAPE_sum

def metrics_pw(
        y_true: Union[np.array, pd.DataFrame],
        y_predicted: Union[np.array, pd.DataFrame]
):
    r2_pw = []
    mae_pw = []
    mse_pw = []
    mape_pw = []
    mmape_pw = []
    for i, j in zip(y_true.iterrows(), y_predicted):
        r2_pw.append(r2_score(i[1], j))
        mae_pw.append(mean_absolute_error(i[1], j))
        mse_pw.append(mean_squared_error(i[1], j))
        mask = [i[1] != 0]
        mape = np.mean(np.abs((i[1][mask[0].values] - j[mask]) / i[1][mask[0].values])) * 100
        if math.isnan(mape):
            continue
        mape_pw.append(mape)
        mmape = np.median(np.abs((i[1][mask[0].values] - j[mask]) / i[1][mask[0].values])) * 100
        mmape_pw.append(mmape)
    return np.array(r2_pw).mean(), np.array(mae_pw).mean(), np.array(mse_pw).mean(), np.array(mape_pw).
mean(), np.array(mmape_pw).mean()
```

Загружаем данные

In [18]:
```
path_to_params = Path('../datasets/seq/water')
debs = Path(path_to_params).glob('*debits.csv')
deb = pd.DataFrame()
params = Path(path_to_params).glob('*batch.csv')
param = pd.DataFrame()
for i in params:
    tmp = pd.read_csv(i,index_col=0)
    param = pd.concat([param, tmp], ignore_index=True)
    print(f'Loaded data: {i}')
for i in debs:
    tmp = pd.read_csv(i,index_col=0)
    deb = pd.concat([deb, tmp], ignore_index=True)
    print(f'Loaded data: {i}')
```

```
Loaded data: ..\datasets\seq\water\batch_1_0-99_wo_In_batch.csv
Loaded data: ..\datasets\seq\water\batch_1_100-199_wo_In_batch.csv
Loaded data: ..\datasets\seq\water\batch_1_200-499_wo_In_batch.csv
Loaded data: ..\datasets\seq\water\batch_1_500-999_wo_In_batch.csv
Loaded data: ..\datasets\seq\water\batch_2_wo_In_batch.csv
Loaded data: ..\datasets\seq\water\batch_3_wo_In_batch.csv
Loaded data: ..\datasets\seq\water\batch_4_wo_In_batch.csv
Loaded data: ..\datasets\seq\water\batch_1_0-99_wo_debits.csv
Loaded data: ..\datasets\seq\water\batch_1_100-199_wo_debits.csv
Loaded data: ..\datasets\seq\water\batch_1_200-499_wo_debits.csv
Loaded data: ..\datasets\seq\water\batch_1_500-999_wo_debits.csv
Loaded data: ..\datasets\seq\water\batch_2_wo_debits.csv
Loaded data: ..\datasets\seq\water\batch_3_wo_debits.csv
Loaded data: ..\datasets\seq\water\batch_4_wo_debits.csv
```

In [19]:
```
X = param
Y = deb
ind=len(X)
```

In [20]:
```
X
```

Out[20]:

	SO	poro	VD	pres	Anisothropy	perm	inj_rate	SQ	temp	steam_temp	heatcr
0	0.84	0.20	8	31	0.60	200	317	0.79	99	271	2390
1	0.75	0.35	8	46	0.69	800	183	0.81	84	247	2408
2	0.74	0.15	16	54	0.97	800	170	0.52	49	278	2578
3	0.51	0.20	14	44	0.94	200	302	0.86	90	208	2680
4	0.67	0.15	4	46	0.11	800	300	0.71	90	228	2324
...	...	...	...	...	...	...	...	...	...	...	...
3281	0.87	0.15	13	62	0.29	150	165	0.87	74	237	2151
3282	0.84	0.20	15	64	0.68	900	241	0.74	101	268	2577
3283	0.63	0.40	12	62	0.39	600	310	0.71	69	191	2675
3284	0.65	0.15	10	51	0.51	900	211	0.51	108	243	2779
3285	0.75	0.25	4	62	0.33	400	197	0.89	82	254	1964

3286 rows × 11 columns

In [21]:
```
X.drop({'SQ','steam_temp'},axis=1,inplace=True)
X
```

Out[21]:

	SO	poro	VD	pres	Anisothropy	perm	inj_rate	temp	heatcr
0	0.84	0.20	8	31	0.60	200	317	99	2390
1	0.75	0.35	8	46	0.69	800	183	84	2408
2	0.74	0.15	16	54	0.97	800	170	49	2578
3	0.51	0.20	14	44	0.94	200	302	90	2680
4	0.67	0.15	4	46	0.11	800	300	90	2324
...	...	...	...	...	...	...	...	...	...
3281	0.87	0.15	13	62	0.29	150	165	74	2151
3282	0.84	0.20	15	64	0.68	900	241	101	2577
3283	0.63	0.40	12	62	0.39	600	310	69	2675
3284	0.65	0.15	10	51	0.51	900	211	108	2779
3285	0.75	0.25	4	62	0.33	400	197	82	1964

3286 rows × 9 columns

In [22]:
```
Y
```

Out[22]:

	0	1	2	3	4	5	6	7	8	9	10	
0	141.727678	83.129849	91.248891	115.220274	103.826376	95.958622	89.076483	81.293112	73.723770	67.244986	61.704541	56.8
1	130.433223	130.877083	108.439330	91.961432	81.602634	74.817328	68.526982	64.123907	60.719963	57.804083	55.029168	52.7
2	111.830706	66.287333	81.194689	79.964741	75.781038	72.501985	64.959030	60.217281	57.759762	53.344992	47.274737	41.5
3	99.610610	53.081568	33.711720	24.518512	19.167808	16.468650	14.131553	12.617986	11.460548	10.371196	9.501614	8.7
4	62.689597	52.365188	45.623790	40.291627	36.382129	33.136778	30.434036	28.047353	25.680443	23.836651	22.389672	21.1
...	...	...	...	...	...	...	...	...	...	...	...	
3281	179.881095	80.847179	74.316832	69.070847	60.125494	52.771177	46.244483	41.096456	37.293379	34.099976	31.477765	29.6
3282	759.690384	352.300812	216.415234	146.436272	108.454314	89.906387	77.252374	69.036800	63.533200	60.104973	56.453145	52.8
3283	59.163501	55.135715	54.381975	52.521704	49.522587	46.081740	42.685926	39.064790	36.010256	33.557082	31.060140	28.8
3284	211.224380	93.130698	60.474397	47.785628	41.122073	36.528243	33.009604	30.218247	27.958599	25.951669	24.083923	22.3
3285	76.285642	45.865199	44.798468	41.350271	37.685917	34.563281	31.124686	27.731800	24.307437	21.877599	19.649425	17.4

3286 rows × 17 columns

Задаем гиперпараметры сети

In [23]:
```
verbose = 2
epochs = 200
batch_size = 256
n_timesteps = Y.shape[1]
n_features = X.shape[1]
dropout_rate=0.2
#a_r=l1(0.001)
```

Задаем саму сеть и обучаем её с 10-блочной кросс-валидацией

In [10]:

```python
R2_sum = []
MAE_sum = []
MSE_sum = []
MAPE_sum = []
MMAPE_sum = []

R2_median_pw = []
MAE_mean_pw = []
MSE_mean_pw =[]
MAPE_mean_pw = []
MAPE_median_pw =[]

histories=[]

CV = KFold(10, random_state=5)
for train_ind, test_ind in tqdm(CV.split(X)):
    train_x, test_x = X.iloc[train_ind], X.iloc[test_ind]
    train_y, test_y = Y.iloc[train_ind, :], Y.iloc[test_ind, :]

    scaler_X = MinMaxScaler()
    scaler_X.fit(np.array(train_x))

    scaler_y = np.mean(np.mean(train_y))

    train_x_transformed,train_y_transformed = scaler_X.transform(np.array(train_x)) , train_y / scaler_
y
    test_x_transformed, test_y_transformed = scaler_X.transform(np.array(test_x)) , test_y / scaler_y

    model = Sequential()
    model.add(keras.layers.RepeatVector(n_timesteps, input_shape=(n_features,)))
    model.add(GRU(64,return_sequences=True))
    model.add(keras.layers.Dropout(dropout_rate))
    model.add(GRU(64,return_sequences=True))
    model.add(GRU(32,return_sequences=True))
    model.add(keras.layers.Dense(1))

    checkpoint = ModelCheckpoint(f"SAGD_model_{ind}.hdf5", monitor='val_loss',save_best_only=True)
    opt = keras.optimizers.Adam(learning_rate=0.01)

    model.compile(optimizer=opt, loss='mae')
    history = model.fit(train_x_transformed, train_y_transformed, epochs=epochs, validation_split=0.2,
                        verbose=2, batch_size=batch_size, callbacks = [checkpoint], shuffle = False
    )
    histories.append(history)

    best_model = keras.models.load_model(f"SAGD_model_{ind}.hdf5")

    predicted_y = best_model.predict(test_x_transformed)
    predicted_y = predicted_y.reshape(predicted_y.shape[:-1])
    predicted_y = predicted_y * scaler_y
    predicted_y[predicted_y < 0] = 0

    R2_median_pw_tmp, MAE_mean_pw_tmp, MSE_mean_pw_tmp, MAPE_mean_pw_tmp, MAPE_median_pw_tmp = metrics_
pw(test_y, predicted_y)
    R2_sum_tmp , MAE_sum_tmp, MSE_sum_tmp, MAPE_sum_tmp, MMAPE_sum_tmp = metrics_sum(test_y, predicted_
y)

    R2_sum.append(R2_sum_tmp)
    MAE_sum.append(MAE_sum_tmp)
    MSE_sum.append(MSE_sum_tmp)
    MAPE_sum.append(MAPE_sum_tmp)
    MMAPE_sum.append(MMAPE_sum_tmp)

    R2_median_pw.append(R2_median_pw_tmp)
    MAE_mean_pw.append(MAE_mean_pw_tmp)
    MSE_mean_pw.append(MSE_mean_pw_tmp)
    MAPE_mean_pw.append(MAPE_mean_pw_tmp)
    MAPE_median_pw.append(MAPE_median_pw_tmp)
```

```
0it [00:00, ?it/s]
```

```
Epoch 1/200
6/6 - 19s - loss: 0.8221 - val_loss: 0.6074
Epoch 2/200
6/6 - 2s - loss: 0.5770 - val_loss: 0.5443
Epoch 3/200
6/6 - 2s - loss: 0.5049 - val_loss: 0.5298
Epoch 4/200
6/6 - 2s - loss: 0.4544 - val_loss: 0.4477
Epoch 5/200
6/6 - 2s - loss: 0.4126 - val_loss: 0.4043
Epoch 6/200
6/6 - 2s - loss: 0.3708 - val_loss: 0.3601
Epoch 7/200
6/6 - 2s - loss: 0.3439 - val_loss: 0.3512
Epoch 8/200
6/6 - 2s - loss: 0.3251 - val_loss: 0.3334
Epoch 9/200
6/6 - 2s - loss: 0.3094 - val_loss: 0.3189
Epoch 10/200
6/6 - 2s - loss: 0.3023 - val_loss: 0.2918
Epoch 11/200
6/6 - 2s - loss: 0.2781 - val_loss: 0.2855
Epoch 12/200
6/6 - 2s - loss: 0.2672 - val_loss: 0.2781
Epoch 13/200
6/6 - 2s - loss: 0.2840 - val_loss: 0.2867
Epoch 14/200
6/6 - 2s - loss: 0.2635 - val_loss: 0.2591
Epoch 15/200
6/6 - 2s - loss: 0.2420 - val_loss: 0.2564
Epoch 16/200
6/6 - 2s - loss: 0.2370 - val_loss: 0.2424
Epoch 17/200
6/6 - 2s - loss: 0.2560 - val_loss: 0.2722
Epoch 18/200
6/6 - 2s - loss: 0.2479 - val_loss: 0.2701
Epoch 19/200
6/6 - 2s - loss: 0.2295 - val_loss: 0.2372
Epoch 20/200
6/6 - 2s - loss: 0.2286 - val_loss: 0.2310
Epoch 21/200
6/6 - 2s - loss: 0.2239 - val_loss: 0.2298
Epoch 22/200
6/6 - 2s - loss: 0.2112 - val_loss: 0.2243
Epoch 23/200
6/6 - 2s - loss: 0.2192 - val_loss: 0.2065
Epoch 24/200
6/6 - 2s - loss: 0.2018 - val_loss: 0.1974
Epoch 25/200
6/6 - 2s - loss: 0.2011 - val_loss: 0.1951
Epoch 26/200
6/6 - 2s - loss: 0.1979 - val_loss: 0.2148
Epoch 27/200
6/6 - 2s - loss: 0.1988 - val_loss: 0.1918
Epoch 28/200
6/6 - 2s - loss: 0.1909 - val_loss: 0.1836
Epoch 29/200
6/6 - 2s - loss: 0.1872 - val_loss: 0.1893
Epoch 30/200
6/6 - 2s - loss: 0.1962 - val_loss: 0.1848
Epoch 31/200
6/6 - 2s - loss: 0.2045 - val_loss: 0.2207
Epoch 32/200
6/6 - 2s - loss: 0.2012 - val_loss: 0.2056
Epoch 33/200
6/6 - 2s - loss: 0.1914 - val_loss: 0.1908
Epoch 34/200
6/6 - 2s - loss: 0.1857 - val_loss: 0.1829
Epoch 35/200
6/6 - 2s - loss: 0.1932 - val_loss: 0.2084
Epoch 36/200
6/6 - 2s - loss: 0.1868 - val_loss: 0.1993
Epoch 37/200
6/6 - 2s - loss: 0.1819 - val_loss: 0.1678
Epoch 38/200
6/6 - 2s - loss: 0.1701 - val_loss: 0.1554
Epoch 39/200
6/6 - 2s - loss: 0.1586 - val_loss: 0.1605
Epoch 40/200
6/6 - 2s - loss: 0.1599 - val_loss: 0.1716
Epoch 41/200
6/6 - 2s - loss: 0.1566 - val_loss: 0.1699
Epoch 42/200
6/6 - 2s - loss: 0.1575 - val_loss: 0.1356
Epoch 43/200
6/6 - 2s - loss: 0.1427 - val_loss: 0.1386
Epoch 44/200
6/6 - 2s - loss: 0.1441 - val_loss: 0.1399
Epoch 45/200
6/6 - 2s - loss: 0.1519 - val_loss: 0.1451
Epoch 46/200
6/6 - 2s - loss: 0.1522 - val_loss: 0.1542
Epoch 47/200
6/6 - 2s - loss: 0.1596 - val_loss: 0.1690
Epoch 48/200
6/6 - 2s - loss: 0.1574 - val_loss: 0.1418
Epoch 49/200
6/6 - 2s - loss: 0.1627 - val_loss: 0.1775
Epoch 50/200
6/6 - 2s - loss: 0.1650 - val_loss: 0.1692
Epoch 51/200
6/6 - 2s - loss: 0.1670 - val_loss: 0.1997
Epoch 52/200
6/6 - 2s - loss: 0.1791 - val_loss: 0.1347
Epoch 53/200
6/6 - 2s - loss: 0.1562 - val_loss: 0.1407
Epoch 54/200
6/6 - 2s - loss: 0.1423 - val_loss: 0.1470
Epoch 55/200
6/6 - 2s - loss: 0.1471 - val_loss: 0.1383
Epoch 56/200
6/6 - 2s - loss: 0.1400 - val_loss: 0.1433
Epoch 57/200
6/6 - 2s - loss: 0.1407 - val_loss: 0.1412
Epoch 58/200
6/6 - 2s - loss: 0.1357 - val_loss: 0.1196
Epoch 59/200
6/6 - 2s - loss: 0.1227 - val_loss: 0.1171
Epoch 60/200
6/6 - 2s - loss: 0.1213 - val_loss: 0.1189
Epoch 61/200
6/6 - 2s - loss: 0.1232 - val_loss: 0.1193
Epoch 62/200
6/6 - 2s - loss: 0.1287 - val_loss: 0.1204
Epoch 63/200
6/6 - 2s - loss: 0.1276 - val_loss: 0.1297
Epoch 64/200
6/6 - 2s - loss: 0.1266 - val_loss: 0.1225
Epoch 65/200
6/6 - 2s - loss: 0.1330 - val_loss: 0.1329
Epoch 66/200
6/6 - 2s - loss: 0.1277 - val_loss: 0.1175
Epoch 67/200
6/6 - 2s - loss: 0.1193 - val_loss: 0.1178
Epoch 68/200
6/6 - 2s - loss: 0.1166 - val_loss: 0.1309
Epoch 69/200
6/6 - 2s - loss: 0.1303 - val_loss: 0.1225
Epoch 70/200
6/6 - 2s - loss: 0.1260 - val_loss: 0.1180
Epoch 71/200
6/6 - 2s - loss: 0.1244 - val_loss: 0.1119
Epoch 72/200
6/6 - 2s - loss: 0.1202 - val_loss: 0.1189
Epoch 73/200
6/6 - 2s - loss: 0.1173 - val_loss: 0.1243
Epoch 74/200
6/6 - 2s - loss: 0.1194 - val_loss: 0.1156
Epoch 75/200
6/6 - 2s - loss: 0.1259 - val_loss: 0.1560
Epoch 76/200
6/6 - 2s - loss: 0.1497 - val_loss: 0.1884
Epoch 77/200
6/6 - 2s - loss: 0.1698 - val_loss: 0.1470
Epoch 78/200
6/6 - 2s - loss: 0.1416 - val_loss: 0.1359
Epoch 79/200
6/6 - 2s - loss: 0.1316 - val_loss: 0.1242
Epoch 80/200
6/6 - 2s - loss: 0.1294 - val_loss: 0.1164
Epoch 81/200
6/6 - 2s - loss: 0.1153 - val_loss: 0.1134
Epoch 82/200
6/6 - 2s - loss: 0.1192 - val_loss: 0.1311
Epoch 83/200
6/6 - 2s - loss: 0.1229 - val_loss: 0.1433
Epoch 84/200
6/6 - 2s - loss: 0.1247 - val_loss: 0.1215
Epoch 85/200
6/6 - 2s - loss: 0.1181 - val_loss: 0.1167
Epoch 86/200
6/6 - 2s - loss: 0.1158 - val_loss: 0.1368
Epoch 87/200
6/6 - 2s - loss: 0.1276 - val_loss: 0.1332
Epoch 88/200
6/6 - 2s - loss: 0.1302 - val_loss: 0.1410
Epoch 89/200
6/6 - 2s - loss: 0.1343 - val_loss: 0.1152
Epoch 90/200
6/6 - 2s - loss: 0.1171 - val_loss: 0.1170
Epoch 91/200
6/6 - 2s - loss: 0.1122 - val_loss: 0.1125
Epoch 92/200
6/6 - 2s - loss: 0.1145 - val_loss: 0.1254
Epoch 93/200
6/6 - 2s - loss: 0.1127 - val_loss: 0.1066
Epoch 94/200
6/6 - 2s - loss: 0.1085 - val_loss: 0.0992
Epoch 95/200
6/6 - 2s - loss: 0.0994 - val_loss: 0.1077
Epoch 96/200
6/6 - 2s - loss: 0.1060 - val_loss: 0.1002
Epoch 97/200
6/6 - 2s - loss: 0.1058 - val_loss: 0.0971
Epoch 98/200
6/6 - 2s - loss: 0.1040 - val_loss: 0.1200
Epoch 99/200
6/6 - 2s - loss: 0.1058 - val_loss: 0.1020
Epoch 100/200
6/6 - 2s - loss: 0.1069 - val_loss: 0.1023
Epoch 101/200
6/6 - 2s - loss: 0.1050 - val_loss: 0.1102
Epoch 102/200
6/6 - 2s - loss: 0.1049 - val_loss: 0.1066
Epoch 103/200
6/6 - 2s - loss: 0.1118 - val_loss: 0.0998
Epoch 104/200
6/6 - 2s - loss: 0.1081 - val_loss: 0.1268
Epoch 105/200
6/6 - 2s - loss: 0.1216 - val_loss: 0.1511
Epoch 106/200
6/6 - 2s - loss: 0.1365 - val_loss: 0.1111
Epoch 107/200
6/6 - 2s - loss: 0.1208 - val_loss: 0.1231
Epoch 108/200
6/6 - 2s - loss: 0.1112 - val_loss: 0.1026
Epoch 109/200
6/6 - 2s - loss: 0.1040 - val_loss: 0.1063
Epoch 110/200
6/6 - 2s - loss: 0.1031 - val_loss: 0.1076
Epoch 111/200
6/6 - 2s - loss: 0.1003 - val_loss: 0.1001
Epoch 112/200
6/6 - 2s - loss: 0.1034 - val_loss: 0.1126
Epoch 113/200
6/6 - 2s - loss: 0.1073 - val_loss: 0.1195
Epoch 114/200
6/6 - 2s - loss: 0.1020 - val_loss: 0.1100
Epoch 115/200
6/6 - 2s - loss: 0.1015 - val_loss: 0.1155
Epoch 116/200
6/6 - 2s - loss: 0.1004 - val_loss: 0.1040
Epoch 117/200
6/6 - 2s - loss: 0.1003 - val_loss: 0.1073
Epoch 118/200
6/6 - 2s - loss: 0.1042 - val_loss: 0.1260
Epoch 119/200
6/6 - 2s - loss: 0.1047 - val_loss: 0.1137
Epoch 120/200
6/6 - 2s - loss: 0.1050 - val_loss: 0.1209
Epoch 121/200
6/6 - 2s - loss: 0.1102 - val_loss: 0.1050
Epoch 122/200
6/6 - 2s - loss: 0.1139 - val_loss: 0.1029
Epoch 123/200
6/6 - 2s - loss: 0.1041 - val_loss: 0.1081
Epoch 124/200
6/6 - 2s - loss: 0.0991 - val_loss: 0.1116
Epoch 125/200
6/6 - 2s - loss: 0.1002 - val_loss: 0.1216
Epoch 126/200
6/6 - 2s - loss: 0.1067 - val_loss: 0.0944
Epoch 127/200
6/6 - 2s - loss: 0.0980 - val_loss: 0.1012
Epoch 128/200
6/6 - 2s - loss: 0.0958 - val_loss: 0.0945
Epoch 129/200
6/6 - 2s - loss: 0.0951 - val_loss: 0.0923
Epoch 130/200
6/6 - 2s - loss: 0.0929 - val_loss: 0.0992
Epoch 131/200
6/6 - 2s - loss: 0.0965 - val_loss: 0.0950
Epoch 132/200
6/6 - 2s - loss: 0.0983 - val_loss: 0.0888
Epoch 133/200
6/6 - 2s - loss: 0.0975 - val_loss: 0.0978
Epoch 134/200
6/6 - 2s - loss: 0.0951 - val_loss: 0.1094
Epoch 135/200
6/6 - 2s - loss: 0.0963 - val_loss: 0.0926
Epoch 136/200
6/6 - 2s - loss: 0.0958 - val_loss: 0.1068
Epoch 137/200
6/6 - 2s - loss: 0.0988 - val_loss: 0.0958
Epoch 138/200
6/6 - 2s - loss: 0.1011 - val_loss: 0.1225
Epoch 139/200
6/6 - 2s - loss: 0.1148 - val_loss: 0.1595
Epoch 140/200
6/6 - 2s - loss: 0.1270 - val_loss: 0.1025
Epoch 141/200
6/6 - 2s - loss: 0.1147 - val_loss: 0.1476
Epoch 142/200
6/6 - 2s - loss: 0.1271 - val_loss: 0.1021
Epoch 143/200
6/6 - 2s - loss: 0.1044 - val_loss: 0.1052
Epoch 144/200
6/6 - 2s - loss: 0.1079 - val_loss: 0.0925
Epoch 145/200
6/6 - 2s - loss: 0.0913 - val_loss: 0.0928
Epoch 146/200
6/6 - 2s - loss: 0.0910 - val_loss: 0.0862
Epoch 147/200
6/6 - 2s - loss: 0.0899 - val_loss: 0.1021
Epoch 148/200
6/6 - 2s - loss: 0.0884 - val_loss: 0.0916
Epoch 149/200
6/6 - 2s - loss: 0.0900 - val_loss: 0.0833
Epoch 150/200
6/6 - 2s - loss: 0.0892 - val_loss: 0.0840
Epoch 151/200
6/6 - 2s - loss: 0.0831 - val_loss: 0.0930
Epoch 152/200
6/6 - 2s - loss: 0.0841 - val_loss: 0.0859
Epoch 153/200
6/6 - 2s - loss: 0.0872 - val_loss: 0.0872
Epoch 154/200
6/6 - 2s - loss: 0.0818 - val_loss: 0.0924
Epoch 155/200
6/6 - 2s - loss: 0.0824 - val_loss: 0.0905
Epoch 156/200
6/6 - 2s - loss: 0.0907 - val_loss: 0.0935
Epoch 157/200
6/6 - 2s - loss: 0.0947 - val_loss: 0.0884
Epoch 158/200
6/6 - 2s - loss: 0.0861 - val_loss: 0.0873
Epoch 159/200
6/6 - 2s - loss: 0.0871 - val_loss: 0.1178
Epoch 160/200
6/6 - 2s - loss: 0.1067 - val_loss: 0.1046
Epoch 161/200
6/6 - 2s - loss: 0.0994 - val_loss: 0.1057
Epoch 162/200
6/6 - 2s - loss: 0.0940 - val_loss: 0.0931
Epoch 163/200
6/6 - 2s - loss: 0.0901 - val_loss: 0.0972
Epoch 164/200
6/6 - 2s - loss: 0.0874 - val_loss: 0.0948
Epoch 165/200
6/6 - 2s - loss: 0.0935 - val_loss: 0.1018
Epoch 166/200
6/6 - 2s - loss: 0.0947 - val_loss: 0.1164
Epoch 167/200
6/6 - 2s - loss: 0.0950 - val_loss: 0.1017
Epoch 168/200
6/6 - 2s - loss: 0.0950 - val_loss: 0.1180
Epoch 169/200
6/6 - 2s - loss: 0.0969 - val_loss: 0.1043
Epoch 170/200
6/6 - 2s - loss: 0.1029 - val_loss: 0.1059
Epoch 171/200
6/6 - 2s - loss: 0.0974 - val_loss: 0.0948
Epoch 172/200
6/6 - 2s - loss: 0.0954 - val_loss: 0.1203
Epoch 173/200
6/6 - 2s - loss: 0.1005 - val_loss: 0.0938
Epoch 174/200
6/6 - 2s - loss: 0.0924 - val_loss: 0.0995
Epoch 175/200
6/6 - 2s - loss: 0.0884 - val_loss: 0.0989
Epoch 176/200
6/6 - 2s - loss: 0.0944 - val_loss: 0.0941
Epoch 177/200
6/6 - 2s - loss: 0.0902 - val_loss: 0.0828
Epoch 178/200
6/6 - 2s - loss: 0.0913 - val_loss: 0.0880
Epoch 179/200
6/6 - 2s - loss: 0.0874 - val_loss: 0.1108
Epoch 180/200
6/6 - 2s - loss: 0.0944 - val_loss: 0.0933
Epoch 181/200
6/6 - 2s - loss: 0.0860 - val_loss: 0.0955
Epoch 182/200
6/6 - 2s - loss: 0.0847 - val_loss: 0.0947
Epoch 183/200
6/6 - 2s - loss: 0.0871 - val_loss: 0.1275
Epoch 184/200
6/6 - 2s - loss: 0.0980 - val_loss: 0.0902
Epoch 185/200
6/6 - 2s - loss: 0.0951 - val_loss: 0.1024
Epoch 186/200
6/6 - 2s - loss: 0.0904 - val_loss: 0.0952
Epoch 187/200
6/6 - 2s - loss: 0.0926 - val_loss: 0.1493
Epoch 188/200
6/6 - 2s - loss: 0.1134 - val_loss: 0.0891
Epoch 189/200
6/6 - 2s - loss: 0.0933 - val_loss: 0.1231
Epoch 190/200
6/6 - 2s - loss: 0.0942 - val_loss: 0.0923
Epoch 191/200
6/6 - 2s - loss: 0.0898 - val_loss: 0.1198
Epoch 192/200
6/6 - 2s - loss: 0.0933 - val_loss: 0.0916
Epoch 193/200
6/6 - 2s - loss: 0.1010 - val_loss: 0.1465
Epoch 194/200
6/6 - 2s - loss: 0.1159 - val_loss: 0.0916
Epoch 195/200
6/6 - 2s - loss: 0.0873 - val_loss: 0.1045
Epoch 196/200
6/6 - 2s - loss: 0.0971 - val_loss: 0.0906
Epoch 197/200
6/6 - 2s - loss: 0.0897 - val_loss: 0.1112
Epoch 198/200
6/6 - 2s - loss: 0.0996 - val_loss: 0.0918
Epoch 199/200
6/6 - 2s - loss: 0.0818 - val_loss: 0.1037
Epoch 200/200
6/6 - 2s - loss: 0.0935 - val_loss: 0.0798
```

```
1it [06:58, 418.24s/it]
```

```
Epoch 1/200
6/6 - 17s - loss: 0.9230 - val_loss: 0.6228
Epoch 2/200
6/6 - 2s - loss: 0.6044 - val_loss: 0.5832
Epoch 3/200
6/6 - 2s - loss: 0.5300 - val_loss: 0.5203
Epoch 4/200
6/6 - 2s - loss: 0.4632 - val_loss: 0.4259
Epoch 5/200
6/6 - 2s - loss: 0.4166 - val_loss: 0.3997
Epoch 6/200
6/6 - 2s - loss: 0.3835 - val_loss: 0.3834
Epoch 7/200
6/6 - 2s - loss: 0.3728 - val_loss: 0.3659
Epoch 8/200
6/6 - 2s - loss: 0.3575 - val_loss: 0.3321
Epoch 9/200
6/6 - 2s - loss: 0.3192 - val_loss: 0.3208
Epoch 10/200
6/6 - 2s - loss: 0.3156 - val_loss: 0.3159
Epoch 11/200
6/6 - 2s - loss: 0.2973 - val_loss: 0.2951
Epoch 12/200
6/6 - 2s - loss: 0.2907 - val_loss: 0.2908
Epoch 13/200
6/6 - 2s - loss: 0.2816 - val_loss: 0.2727
Epoch 14/200
6/6 - 2s - loss: 0.2684 - val_loss: 0.2601
Epoch 15/200
6/6 - 2s - loss: 0.2594 - val_loss: 0.2589
Epoch 16/200
6/6 - 2s - loss: 0.2546 - val_loss: 0.2514
Epoch 17/200
6/6 - 2s - loss: 0.2410 - val_loss: 0.2469
Epoch 18/200
6/6 - 2s - loss: 0.2341 - val_loss: 0.2576
Epoch 19/200
6/6 - 2s - loss: 0.2356 - val_loss: 0.2550
Epoch 20/200
6/6 - 2s - loss: 0.2337 - val_loss: 0.2230
Epoch 21/200
6/6 - 2s - loss: 0.2213 - val_loss: 0.2224
Epoch 22/200
6/6 - 2s - loss: 0.2366 - val_loss: 0.2248
Epoch 23/200
6/6 - 2s - loss: 0.2879 - val_loss: 0.2438
Epoch 24/200
6/6 - 2s - loss: 0.2362 - val_loss: 0.2328
Epoch 25/200
6/6 - 2s - loss: 0.2294 - val_loss: 0.2349
Epoch 26/200
6/6 - 2s - loss: 0.2260 - val_loss: 0.2580
Epoch 27/200
6/6 - 2s - loss: 0.2266 - val_loss: 0.2177
Epoch 28/200
6/6 - 2s - loss: 0.2093 - val_loss: 0.2060
Epoch 29/200
6/6 - 2s - loss: 0.2017 - val_loss: 0.2005
Epoch 30/200
6/6 - 2s - loss: 0.2008 - val_loss: 0.2260
Epoch 31/200
6/6 - 2s - loss: 0.2079 - val_loss: 0.2318
Epoch 32/200
6/6 - 2s - loss: 0.2034 - val_loss: 0.2097
Epoch 33/200
6/6 - 2s - loss: 0.2013 - val_loss: 0.1930
Epoch 34/200
6/6 - 2s - loss: 0.1920 - val_loss: 0.1874
Epoch 35/200
6/6 - 2s - loss: 0.1813 - val_loss: 0.1903
Epoch 36/200
6/6 - 2s - loss: 0.1866 - val_loss: 0.1765
Epoch 37/200
6/6 - 2s - loss: 0.1816 - val_loss: 0.1765
Epoch 38/200
6/6 - 2s - loss: 0.1778 - val_loss: 0.1794
Epoch 39/200
6/6 - 2s - loss: 0.1773 - val_loss: 0.1734
Epoch 40/200
6/6 - 2s - loss: 0.1752 - val_loss: 0.1765
Epoch 41/200
6/6 - 2s - loss: 0.1796 - val_loss: 0.2057
Epoch 42/200
6/6 - 2s - loss: 0.1982 - val_loss: 0.2056
Epoch 43/200
6/6 - 2s - loss: 0.1763 - val_loss: 0.1651
Epoch 44/200
6/6 - 2s - loss: 0.1783 - val_loss: 0.1793
Epoch 45/200
6/6 - 2s - loss: 0.1804 - val_loss: 0.1524
Epoch 46/200
6/6 - 2s - loss: 0.1585 - val_loss: 0.1625
Epoch 47/200
6/6 - 2s - loss: 0.1618 - val_loss: 0.1557
Epoch 48/200
6/6 - 2s - loss: 0.1631 - val_loss: 0.1566
Epoch 49/200
6/6 - 2s - loss: 0.1551 - val_loss: 0.1489
Epoch 50/200
6/6 - 2s - loss: 0.1511 - val_loss: 0.1443
Epoch 51/200
6/6 - 2s - loss: 0.1494 - val_loss: 0.1456
Epoch 52/200
6/6 - 2s - loss: 0.1490 - val_loss: 0.1478
Epoch 53/200
6/6 - 2s - loss: 0.1467 - val_loss: 0.1464
Epoch 54/200
6/6 - 2s - loss: 0.1500 - val_loss: 0.1388
Epoch 55/200
6/6 - 2s - loss: 0.1586 - val_loss: 0.1352
Epoch 56/200
6/6 - 2s - loss: 0.1558 - val_loss: 0.1386
Epoch 57/200
6/6 - 2s - loss: 0.1467 - val_loss: 0.1355
Epoch 58/200
6/6 - 2s - loss: 0.1414 - val_loss: 0.1445
Epoch 59/200
6/6 - 2s - loss: 0.1408 - val_loss: 0.1488
Epoch 60/200
6/6 - 2s - loss: 0.1449 - val_loss: 0.1342
Epoch 61/200
6/6 - 2s - loss: 0.1581 - val_loss: 0.1482
Epoch 62/200
6/6 - 2s - loss: 0.1570 - val_loss: 0.1325
Epoch 63/200
6/6 - 2s - loss: 0.1471 - val_loss: 0.1653
Epoch 64/200
6/6 - 2s - loss: 0.1477 - val_loss: 0.1313
Epoch 65/200
6/6 - 2s - loss: 0.1435 - val_loss: 0.1309
Epoch 66/200
6/6 - 2s - loss: 0.1361 - val_loss: 0.1335
Epoch 67/200
6/6 - 2s - loss: 0.1365 - val_loss: 0.1302
Epoch 68/200
6/6 - 2s - loss: 0.1410 - val_loss: 0.1277
Epoch 69/200
6/6 - 2s - loss: 0.1364 - val_loss: 0.1491
Epoch 70/200
6/6 - 2s - loss: 0.1445 - val_loss: 0.1352
Epoch 71/200
6/6 - 2s - loss: 0.1320 - val_loss: 0.1366
Epoch 72/200
6/6 - 2s - loss: 0.1398 - val_loss: 0.1261
Epoch 73/200
6/6 - 2s - loss: 0.1327 - val_loss: 0.1225
Epoch 74/200
6/6 - 2s - loss: 0.1330 - val_loss: 0.1198
Epoch 75/200
6/6 - 2s - loss: 0.1261 - val_loss: 0.1150
Epoch 76/200
6/6 - 2s - loss: 0.1196 - val_loss: 0.1260
Epoch 77/200
6/6 - 2s - loss: 0.1265 - val_loss: 0.1235
Epoch 78/200
6/6 - 2s - loss: 0.1279 - val_loss: 0.1414
Epoch 79/200
6/6 - 2s - loss: 0.1464 - val_loss: 0.1517
Epoch 80/200
6/6 - 2s - loss: 0.1406 - val_loss: 0.1258
Epoch 81/200
6/6 - 2s - loss: 0.1476 - val_loss: 0.1320
Epoch 82/200
6/6 - 2s - loss: 0.1336 - val_loss: 0.1484
Epoch 83/200
6/6 - 2s - loss: 0.1365 - val_loss: 0.1314
Epoch 84/200
6/6 - 2s - loss: 0.1340 - val_loss: 0.1227
Epoch 85/200
6/6 - 2s - loss: 0.1169 - val_loss: 0.1197
Epoch 86/200
6/6 - 2s - loss: 0.1176 - val_loss: 0.1126
Epoch 87/200
6/6 - 2s - loss: 0.1179 - val_loss: 0.1120
Epoch 88/200
6/6 - 2s - loss: 0.1158 - val_loss: 0.1098
Epoch 89/200
6/6 - 2s - loss: 0.1118 - val_loss: 0.1338
Epoch 90/200
6/6 - 2s - loss: 0.1169 - val_loss: 0.1139
Epoch 91/200
6/6 - 2s - loss: 0.1314 - val_loss: 0.1188
Epoch 92/200
6/6 - 2s - loss: 0.1297 - val_loss: 0.1641
Epoch 93/200
6/6 - 2s - loss: 0.1390 - val_loss: 0.1203
Epoch 94/200
6/6 - 2s - loss: 0.1265 - val_loss: 0.1293
Epoch 95/200
6/6 - 2s - loss: 0.1197 - val_loss: 0.1175
Epoch 96/200
6/6 - 2s - loss: 0.1157 - val_loss: 0.1080
Epoch 97/200
6/6 - 2s - loss: 0.1199 - val_loss: 0.1203
Epoch 98/200
6/6 - 2s - loss: 0.1134 - val_loss: 0.1119
Epoch 99/200
6/6 - 2s - loss: 0.1123 - val_loss: 0.1119
Epoch 100/200
6/6 - 2s - loss: 0.1143 - val_loss: 0.1089
Epoch 101/200
6/6 - 2s - loss: 0.1061 - val_loss: 0.1066
Epoch 102/200
6/6 - 2s - loss: 0.1071 - val_loss: 0.1033
Epoch 103/200
6/6 - 2s - loss: 0.1101 - val_loss: 0.1065
Epoch 104/200
6/6 - 2s - loss: 0.1112 - val_loss: 0.0992
Epoch 105/200
6/6 - 2s - loss: 0.1017 - val_loss: 0.1108
Epoch 106/200
6/6 - 2s - loss: 0.1058 - val_loss: 0.1023
Epoch 107/200
6/6 - 2s - loss: 0.1071 - val_loss: 0.1073
Epoch 108/200
6/6 - 2s - loss: 0.1079 - val_loss: 0.0989
Epoch 109/200
6/6 - 2s - loss: 0.1056 - val_loss: 0.0991
Epoch 110/200
6/6 - 2s - loss: 0.1014 - val_loss: 0.0983
Epoch 111/200
6/6 - 2s - loss: 0.1088 - val_loss: 0.1089
Epoch 112/200
6/6 - 2s - loss: 0.1021 - val_loss: 0.1071
Epoch 113/200
6/6 - 2s - loss: 0.1100 - val_loss: 0.1055
Epoch 114/200
6/6 - 2s - loss: 0.1105 - val_loss: 0.1016
Epoch 115/200
6/6 - 2s - loss: 0.1077 - val_loss: 0.0976
Epoch 116/200
6/6 - 2s - loss: 0.1046 - val_loss: 0.0986
Epoch 117/200
6/6 - 2s - loss: 0.1087 - val_loss: 0.0954
Epoch 118/200
6/6 - 2s - loss: 0.1107 - val_loss: 0.1107
Epoch 119/200
6/6 - 2s - loss: 0.1127 - val_loss: 0.1358
Epoch 120/200
6/6 - 2s - loss: 0.1188 - val_loss: 0.1158
Epoch 121/200
6/6 - 2s - loss: 0.1185 - val_loss: 0.1133
Epoch 122/200
6/6 - 2s - loss: 0.1210 - val_loss: 0.1090
Epoch 123/200
6/6 - 2s - loss: 0.1059 - val_loss: 0.1064
Epoch 124/200
6/6 - 2s - loss: 0.1076 - val_loss: 0.1166
Epoch 125/200
6/6 - 2s - loss: 0.1102 - val_loss: 0.1010
Epoch 126/200
6/6 - 2s - loss: 0.1086 - val_loss: 0.1086
Epoch 127/200
6/6 - 2s - loss: 0.1046 - val_loss: 0.1315
Epoch 128/200
6/6 - 2s - loss: 0.1227 - val_loss: 0.1131
Epoch 129/200
6/6 - 2s - loss: 0.1137 - val_loss: 0.0976
Epoch 130/200
6/6 - 2s - loss: 0.0991 - val_loss: 0.1238
Epoch 131/200
6/6 - 2s - loss: 0.1113 - val_loss: 0.1058
Epoch 132/200
6/6 - 2s - loss: 0.1072 - val_loss: 0.1102
Epoch 133/200
6/6 - 2s - loss: 0.0992 - val_loss: 0.0968
Epoch 134/200
6/6 - 2s - loss: 0.0952 - val_loss: 0.0986
Epoch 135/200
6/6 - 2s - loss: 0.1006 - val_loss: 0.0895
Epoch 136/200
6/6 - 2s - loss: 0.1015 - val_loss: 0.1032
Epoch 137/200
6/6 - 2s - loss: 0.1087 - val_loss: 0.1283
Epoch 138/200
6/6 - 2s - loss: 0.1004 - val_loss: 0.0981
Epoch 139/200
6/6 - 2s - loss: 0.1092 - val_loss: 0.1079
Epoch 140/200
6/6 - 2s - loss: 0.1136 - val_loss: 0.1780
Epoch 141/200
6/6 - 2s - loss: 0.1331 - val_loss: 0.1006
Epoch 142/200
6/6 - 2s - loss: 0.1065 - val_loss: 0.1241
Epoch 143/200
6/6 - 2s - loss: 0.1088 - val_loss: 0.0896
Epoch 144/200
6/6 - 2s - loss: 0.0959 - val_loss: 0.0913
Epoch 145/200
6/6 - 2s - loss: 0.0928 - val_loss: 0.0903
Epoch 146/200
6/6 - 2s - loss: 0.0986 - val_loss: 0.1146
Epoch 147/200
6/6 - 2s - loss: 0.0978 - val_loss: 0.1054
Epoch 148/200
6/6 - 2s - loss: 0.0964 - val_loss: 0.0894
Epoch 149/200
6/6 - 2s - loss: 0.0975 - val_loss: 0.0997
Epoch 150/200
6/6 - 2s - loss: 0.0918 - val_loss: 0.0911
Epoch 151/200
6/6 - 2s - loss: 0.0928 - val_loss: 0.0904
Epoch 152/200
6/6 - 2s - loss: 0.0942 - val_loss: 0.0900
Epoch 153/200
6/6 - 2s - loss: 0.0897 - val_loss: 0.1045
Epoch 154/200
6/6 - 2s - loss: 0.0910 - val_loss: 0.0882
Epoch 155/200
6/6 - 2s - loss: 0.0975 - val_loss: 0.0972
Epoch 156/200
6/6 - 2s - loss: 0.1038 - val_loss: 0.1822
Epoch 157/200
6/6 - 2s - loss: 0.1332 - val_loss: 0.1028
Epoch 158/200
6/6 - 2s - loss: 0.1048 - val_loss: 0.1422
Epoch 159/200
6/6 - 2s - loss: 0.1279 - val_loss: 0.1220
Epoch 160/200
6/6 - 2s - loss: 0.1031 - val_loss: 0.0908
Epoch 161/200
6/6 - 2s - loss: 0.1079 - val_loss: 0.1188
Epoch 162/200
6/6 - 2s - loss: 0.0953 - val_loss: 0.0867
Epoch 163/200
6/6 - 2s - loss: 0.0960 - val_loss: 0.0886
Epoch 164/200
6/6 - 2s - loss: 0.0878 - val_loss: 0.1067
Epoch 165/200
6/6 - 2s - loss: 0.0927 - val_loss: 0.0860
Epoch 166/200
6/6 - 2s - loss: 0.0914 - val_loss: 0.1060
Epoch 167/200
6/6 - 2s - loss: 0.0886 - val_loss: 0.1054
Epoch 168/200
6/6 - 2s - loss: 0.0909 - val_loss: 0.0865
Epoch 169/200
6/6 - 2s - loss: 0.0907 - val_loss: 0.0929
Epoch 170/200
6/6 - 2s - loss: 0.0841 - val_loss: 0.1036
Epoch 171/200
6/6 - 2s - loss: 0.0934 - val_loss: 0.0868
Epoch 172/200
6/6 - 2s - loss: 0.0915 - val_loss: 0.1197
Epoch 173/200
6/6 - 2s - loss: 0.0905 - val_loss: 0.0867
Epoch 174/200
6/6 - 2s - loss: 0.0927 - val_loss: 0.0898
Epoch 175/200
6/6 - 2s - loss: 0.0878 - val_loss: 0.1157
Epoch 176/200
6/6 - 2s - loss: 0.0879 - val_loss: 0.0898
Epoch 177/200
6/6 - 2s - loss: 0.1014 - val_loss: 0.1251
Epoch 178/200
6/6 - 2s - loss: 0.0944 - val_loss: 0.0977
Epoch 179/200
6/6 - 2s - loss: 0.0935 - val_loss: 0.0879
Epoch 180/200
6/6 - 2s - loss: 0.0895 - val_loss: 0.1272
Epoch 181/200
6/6 - 2s - loss: 0.0927 - val_loss: 0.0988
Epoch 182/200
6/6 - 2s - loss: 0.0879 - val_loss: 0.0898
Epoch 183/200
6/6 - 2s - loss: 0.0850 - val_loss: 0.0910
Epoch 184/200
6/6 - 2s - loss: 0.0860 - val_loss: 0.0829
Epoch 185/200
6/6 - 2s - loss: 0.0843 - val_loss: 0.0902
Epoch 186/200
6/6 - 2s - loss: 0.0823 - val_loss: 0.0979
Epoch 187/200
```

```
6/6 - 2s - loss: 0.0872 - val_loss: 0.1056
Epoch 188/200
6/6 - 2s - loss: 0.0989 - val_loss: 0.0845
Epoch 189/200
6/6 - 2s - loss: 0.0921 - val_loss: 0.1217
Epoch 190/200
6/6 - 2s - loss: 0.0961 - val_loss: 0.0852
Epoch 191/200
6/6 - 2s - loss: 0.0910 - val_loss: 0.1345
Epoch 192/200
6/6 - 2s - loss: 0.0951 - val_loss: 0.0889
Epoch 193/200
6/6 - 2s - loss: 0.0886 - val_loss: 0.1145
Epoch 194/200
6/6 - 2s - loss: 0.0932 - val_loss: 0.0833
Epoch 195/200
6/6 - 2s - loss: 0.0922 - val_loss: 0.0926
Epoch 196/200
6/6 - 2s - loss: 0.0888 - val_loss: 0.1101
Epoch 197/200
6/6 - 2s - loss: 0.1050 - val_loss: 0.1290
Epoch 198/200
6/6 - 2s - loss: 0.1004 - val_loss: 0.1168
Epoch 199/200
6/6 - 2s - loss: 0.1072 - val_loss: 0.1223
Epoch 200/200
6/6 - 2s - loss: 0.1049 - val_loss: 0.1056
```

2it [13:54, 417.66s/it]

```
Epoch 1/200
6/6 - 18s - loss: 0.8757 - val_loss: 0.6408
Epoch 2/200
6/6 - 2s - loss: 0.5854 - val_loss: 0.5375
Epoch 3/200
6/6 - 2s - loss: 0.4934 - val_loss: 0.5601
Epoch 4/200
6/6 - 2s - loss: 0.4617 - val_loss: 0.4328
Epoch 5/200
6/6 - 2s - loss: 0.4090 - val_loss: 0.4157
Epoch 6/200
6/6 - 2s - loss: 0.3754 - val_loss: 0.3661
Epoch 7/200
6/6 - 2s - loss: 0.3560 - val_loss: 0.3622
Epoch 8/200
6/6 - 2s - loss: 0.3423 - val_loss: 0.3462
Epoch 9/200
6/6 - 2s - loss: 0.3379 - val_loss: 0.3340
Epoch 10/200
6/6 - 2s - loss: 0.3255 - val_loss: 0.3109
Epoch 11/200
6/6 - 2s - loss: 0.3056 - val_loss: 0.2962
Epoch 12/200
6/6 - 2s - loss: 0.2915 - val_loss: 0.2988
Epoch 13/200
6/6 - 2s - loss: 0.2768 - val_loss: 0.2738
Epoch 14/200
6/6 - 2s - loss: 0.2723 - val_loss: 0.2733
Epoch 15/200
6/6 - 2s - loss: 0.2684 - val_loss: 0.2632
Epoch 16/200
6/6 - 2s - loss: 0.2589 - val_loss: 0.2513
Epoch 17/200
6/6 - 2s - loss: 0.2528 - val_loss: 0.2443
Epoch 18/200
6/6 - 2s - loss: 0.2435 - val_loss: 0.2645
Epoch 19/200
6/6 - 2s - loss: 0.2516 - val_loss: 0.2423
Epoch 20/200
6/6 - 2s - loss: 0.2252 - val_loss: 0.2243
Epoch 21/200
6/6 - 2s - loss: 0.2309 - val_loss: 0.2518
Epoch 22/200
6/6 - 2s - loss: 0.2493 - val_loss: 0.2786
Epoch 23/200
6/6 - 2s - loss: 0.2410 - val_loss: 0.2589
Epoch 24/200
6/6 - 2s - loss: 0.2456 - val_loss: 0.2925
Epoch 25/200
6/6 - 2s - loss: 0.2369 - val_loss: 0.2271
Epoch 26/200
6/6 - 2s - loss: 0.2262 - val_loss: 0.2200
Epoch 27/200
6/6 - 2s - loss: 0.2167 - val_loss: 0.2137
Epoch 28/200
6/6 - 2s - loss: 0.2066 - val_loss: 0.1965
Epoch 29/200
6/6 - 2s - loss: 0.2036 - val_loss: 0.1918
Epoch 30/200
6/6 - 2s - loss: 0.1923 - val_loss: 0.1861
Epoch 31/200
6/6 - 2s - loss: 0.1889 - val_loss: 0.1867
Epoch 32/200
6/6 - 2s - loss: 0.1894 - val_loss: 0.1903
Epoch 33/200
6/6 - 2s - loss: 0.1937 - val_loss: 0.1875
Epoch 34/200
6/6 - 2s - loss: 0.1853 - val_loss: 0.1880
Epoch 35/200
6/6 - 2s - loss: 0.1905 - val_loss: 0.1912
Epoch 36/200
6/6 - 2s - loss: 0.1961 - val_loss: 0.1721
Epoch 37/200
6/6 - 2s - loss: 0.1831 - val_loss: 0.1933
Epoch 38/200
6/6 - 2s - loss: 0.1950 - val_loss: 0.2134
Epoch 39/200
6/6 - 2s - loss: 0.1851 - val_loss: 0.1763
Epoch 40/200
6/6 - 2s - loss: 0.1791 - val_loss: 0.1694
Epoch 41/200
6/6 - 2s - loss: 0.1738 - val_loss: 0.1656
Epoch 42/200
6/6 - 2s - loss: 0.1684 - val_loss: 0.1564
Epoch 43/200
6/6 - 2s - loss: 0.1618 - val_loss: 0.1670
Epoch 44/200
6/6 - 2s - loss: 0.1663 - val_loss: 0.1548
Epoch 45/200
6/6 - 2s - loss: 0.1612 - val_loss: 0.1549
Epoch 46/200
6/6 - 2s - loss: 0.1595 - val_loss: 0.1649
Epoch 47/200
6/6 - 2s - loss: 0.1585 - val_loss: 0.1413
Epoch 48/200
6/6 - 2s - loss: 0.1638 - val_loss: 0.1867
Epoch 49/200
6/6 - 2s - loss: 0.1933 - val_loss: 0.2639
Epoch 50/200
6/6 - 2s - loss: 0.2050 - val_loss: 0.1894
Epoch 51/200
6/6 - 2s - loss: 0.1911 - val_loss: 0.1520
Epoch 52/200
6/6 - 2s - loss: 0.1922 - val_loss: 0.2154
Epoch 53/200
6/6 - 2s - loss: 0.1692 - val_loss: 0.1497
Epoch 54/200
6/6 - 2s - loss: 0.1611 - val_loss: 0.1682
Epoch 55/200
6/6 - 2s - loss: 0.1648 - val_loss: 0.1411
Epoch 56/200
6/6 - 2s - loss: 0.1510 - val_loss: 0.1463
Epoch 57/200
6/6 - 2s - loss: 0.1600 - val_loss: 0.1476
Epoch 58/200
6/6 - 2s - loss: 0.1427 - val_loss: 0.1362
Epoch 59/200
6/6 - 2s - loss: 0.1446 - val_loss: 0.1306
Epoch 60/200
6/6 - 2s - loss: 0.1419 - val_loss: 0.1477
Epoch 61/200
6/6 - 2s - loss: 0.1350 - val_loss: 0.1307
Epoch 62/200
6/6 - 2s - loss: 0.1364 - val_loss: 0.1224
Epoch 63/200
6/6 - 2s - loss: 0.1383 - val_loss: 0.1227
Epoch 64/200
6/6 - 2s - loss: 0.1303 - val_loss: 0.1406
Epoch 65/200
6/6 - 2s - loss: 0.1330 - val_loss: 0.1210
Epoch 66/200
6/6 - 2s - loss: 0.1341 - val_loss: 0.1402
Epoch 67/200
6/6 - 2s - loss: 0.1264 - val_loss: 0.1242
Epoch 68/200
6/6 - 2s - loss: 0.1355 - val_loss: 0.1290
Epoch 69/200
6/6 - 2s - loss: 0.1355 - val_loss: 0.1461
Epoch 70/200
6/6 - 2s - loss: 0.1331 - val_loss: 0.1431
Epoch 71/200
6/6 - 2s - loss: 0.1359 - val_loss: 0.1328
Epoch 72/200
6/6 - 2s - loss: 0.1420 - val_loss: 0.1280
Epoch 73/200
6/6 - 2s - loss: 0.1369 - val_loss: 0.1173
Epoch 74/200
6/6 - 2s - loss: 0.1281 - val_loss: 0.1232
Epoch 75/200
6/6 - 2s - loss: 0.1217 - val_loss: 0.1262
Epoch 76/200
6/6 - 2s - loss: 0.1239 - val_loss: 0.1138
Epoch 77/200
6/6 - 2s - loss: 0.1297 - val_loss: 0.1141
Epoch 78/200
6/6 - 2s - loss: 0.1289 - val_loss: 0.1669
Epoch 79/200
6/6 - 2s - loss: 0.1290 - val_loss: 0.1254
Epoch 80/200
6/6 - 2s - loss: 0.1332 - val_loss: 0.1204
Epoch 81/200
6/6 - 2s - loss: 0.1235 - val_loss: 0.1142
Epoch 82/200
6/6 - 2s - loss: 0.1232 - val_loss: 0.1287
Epoch 83/200
6/6 - 2s - loss: 0.1182 - val_loss: 0.1498
Epoch 84/200
6/6 - 2s - loss: 0.1273 - val_loss: 0.1123
Epoch 85/200
6/6 - 2s - loss: 0.1235 - val_loss: 0.1122
Epoch 86/200
6/6 - 2s - loss: 0.1250 - val_loss: 0.1557
Epoch 87/200
6/6 - 2s - loss: 0.1245 - val_loss: 0.1231
Epoch 88/200
6/6 - 2s - loss: 0.1302 - val_loss: 0.1095
Epoch 89/200
6/6 - 2s - loss: 0.1191 - val_loss: 0.1157
Epoch 90/200
6/6 - 2s - loss: 0.1121 - val_loss: 0.1131
Epoch 91/200
6/6 - 2s - loss: 0.1132 - val_loss: 0.1049
Epoch 92/200
6/6 - 2s - loss: 0.1124 - val_loss: 0.1092
Epoch 93/200
6/6 - 2s - loss: 0.1095 - val_loss: 0.1118
Epoch 94/200
6/6 - 2s - loss: 0.1083 - val_loss: 0.1085
Epoch 95/200
6/6 - 2s - loss: 0.1145 - val_loss: 0.1075
Epoch 96/200
6/6 - 2s - loss: 0.1101 - val_loss: 0.1339
Epoch 97/200
6/6 - 2s - loss: 0.1147 - val_loss: 0.1089
Epoch 98/200
6/6 - 2s - loss: 0.1305 - val_loss: 0.1223
Epoch 99/200
6/6 - 2s - loss: 0.1148 - val_loss: 0.1342
Epoch 100/200
6/6 - 2s - loss: 0.1199 - val_loss: 0.1160
Epoch 101/200
6/6 - 2s - loss: 0.1155 - val_loss: 0.1235
Epoch 102/200
6/6 - 2s - loss: 0.1091 - val_loss: 0.1251
Epoch 103/200
6/6 - 2s - loss: 0.1066 - val_loss: 0.1082
Epoch 104/200
6/6 - 2s - loss: 0.1178 - val_loss: 0.1137
Epoch 105/200
6/6 - 2s - loss: 0.1108 - val_loss: 0.1267
Epoch 106/200
6/6 - 2s - loss: 0.1084 - val_loss: 0.1023
Epoch 107/200
6/6 - 2s - loss: 0.1148 - val_loss: 0.1060
Epoch 108/200
6/6 - 2s - loss: 0.1137 - val_loss: 0.1005
Epoch 109/200
6/6 - 2s - loss: 0.1128 - val_loss: 0.1202
Epoch 110/200
6/6 - 2s - loss: 0.1059 - val_loss: 0.1343
Epoch 111/200
6/6 - 2s - loss: 0.1105 - val_loss: 0.1406
Epoch 112/200
6/6 - 2s - loss: 0.1184 - val_loss: 0.1026
Epoch 113/200
6/6 - 2s - loss: 0.1122 - val_loss: 0.1138
Epoch 114/200
6/6 - 2s - loss: 0.1033 - val_loss: 0.1265
Epoch 115/200
6/6 - 2s - loss: 0.1083 - val_loss: 0.1075
Epoch 116/200
6/6 - 2s - loss: 0.1107 - val_loss: 0.1137
Epoch 117/200
6/6 - 2s - loss: 0.1072 - val_loss: 0.1324
Epoch 118/200
6/6 - 2s - loss: 0.1129 - val_loss: 0.1069
Epoch 119/200
6/6 - 2s - loss: 0.1177 - val_loss: 0.1112
Epoch 120/200
6/6 - 2s - loss: 0.1089 - val_loss: 0.1313
Epoch 121/200
6/6 - 2s - loss: 0.1134 - val_loss: 0.1182
Epoch 122/200
6/6 - 2s - loss: 0.1161 - val_loss: 0.2070
Epoch 123/200
6/6 - 2s - loss: 0.1411 - val_loss: 0.1216
Epoch 124/200
6/6 - 2s - loss: 0.1208 - val_loss: 0.1632
Epoch 125/200
6/6 - 2s - loss: 0.1293 - val_loss: 0.1311
Epoch 126/200
6/6 - 2s - loss: 0.1202 - val_loss: 0.1350
Epoch 127/200
6/6 - 2s - loss: 0.1139 - val_loss: 0.1101
Epoch 128/200
6/6 - 2s - loss: 0.1104 - val_loss: 0.1114
Epoch 129/200
6/6 - 2s - loss: 0.1088 - val_loss: 0.1325
Epoch 130/200
6/6 - 2s - loss: 0.1045 - val_loss: 0.1002
Epoch 131/200
6/6 - 2s - loss: 0.1069 - val_loss: 0.1487
Epoch 132/200
6/6 - 2s - loss: 0.1087 - val_loss: 0.1150
Epoch 133/200
6/6 - 2s - loss: 0.1108 - val_loss: 0.1276
Epoch 134/200
6/6 - 2s - loss: 0.1083 - val_loss: 0.1014
Epoch 135/200
6/6 - 2s - loss: 0.1118 - val_loss: 0.1586
Epoch 136/200
6/6 - 2s - loss: 0.1162 - val_loss: 0.1217
Epoch 137/200
6/6 - 2s - loss: 0.1177 - val_loss: 0.1605
Epoch 138/200
6/6 - 2s - loss: 0.1167 - val_loss: 0.1112
Epoch 139/200
6/6 - 2s - loss: 0.1136 - val_loss: 0.1424
Epoch 140/200
6/6 - 2s - loss: 0.1074 - val_loss: 0.1155
Epoch 141/200
6/6 - 2s - loss: 0.0973 - val_loss: 0.1675
Epoch 142/200
6/6 - 2s - loss: 0.1083 - val_loss: 0.1076
Epoch 143/200
6/6 - 2s - loss: 0.1028 - val_loss: 0.1368
Epoch 144/200
6/6 - 2s - loss: 0.1046 - val_loss: 0.1241
Epoch 145/200
6/6 - 2s - loss: 0.1010 - val_loss: 0.1129
Epoch 146/200
6/6 - 2s - loss: 0.1153 - val_loss: 0.1356
Epoch 147/200
6/6 - 2s - loss: 0.1125 - val_loss: 0.1221
Epoch 148/200
6/6 - 2s - loss: 0.1075 - val_loss: 0.1411
Epoch 149/200
6/6 - 2s - loss: 0.1090 - val_loss: 0.1123
Epoch 150/200
6/6 - 2s - loss: 0.1107 - val_loss: 0.1548
Epoch 151/200
6/6 - 2s - loss: 0.1029 - val_loss: 0.1051
Epoch 152/200
6/6 - 2s - loss: 0.1026 - val_loss: 0.1308
Epoch 153/200
6/6 - 2s - loss: 0.0965 - val_loss: 0.1158
Epoch 154/200
6/6 - 2s - loss: 0.1037 - val_loss: 0.1515
Epoch 155/200
6/6 - 2s - loss: 0.1116 - val_loss: 0.1163
Epoch 156/200
6/6 - 2s - loss: 0.1065 - val_loss: 0.1176
Epoch 157/200
6/6 - 2s - loss: 0.0993 - val_loss: 0.1562
Epoch 158/200
6/6 - 2s - loss: 0.1135 - val_loss: 0.1444
Epoch 159/200
6/6 - 2s - loss: 0.1109 - val_loss: 0.1353
Epoch 160/200
6/6 - 2s - loss: 0.1018 - val_loss: 0.1139
Epoch 161/200
6/6 - 2s - loss: 0.0935 - val_loss: 0.1522
Epoch 162/200
6/6 - 2s - loss: 0.0989 - val_loss: 0.1272
Epoch 163/200
6/6 - 2s - loss: 0.1030 - val_loss: 0.1603
Epoch 164/200
6/6 - 2s - loss: 0.1026 - val_loss: 0.1120
Epoch 165/200
6/6 - 2s - loss: 0.1063 - val_loss: 0.1702
Epoch 166/200
6/6 - 2s - loss: 0.1143 - val_loss: 0.1186
Epoch 167/200
6/6 - 2s - loss: 0.1069 - val_loss: 0.1597
Epoch 168/200
6/6 - 2s - loss: 0.1121 - val_loss: 0.1343
Epoch 169/200
6/6 - 2s - loss: 0.0963 - val_loss: 0.1288
Epoch 170/200
6/6 - 2s - loss: 0.0943 - val_loss: 0.1223
Epoch 171/200
6/6 - 2s - loss: 0.0921 - val_loss: 0.1451
Epoch 172/200
6/6 - 2s - loss: 0.1072 - val_loss: 0.1506
Epoch 173/200
6/6 - 2s - loss: 0.1013 - val_loss: 0.1396
Epoch 174/200
6/6 - 2s - loss: 0.1021 - val_loss: 0.1232
Epoch 175/200
6/6 - 2s - loss: 0.1057 - val_loss: 0.1675
Epoch 176/200
6/6 - 2s - loss: 0.1130 - val_loss: 0.1570
Epoch 177/200
6/6 - 2s - loss: 0.0993 - val_loss: 0.1488
Epoch 178/200
6/6 - 2s - loss: 0.0988 - val_loss: 0.1311
Epoch 179/200
6/6 - 2s - loss: 0.1002 - val_loss: 0.1728
Epoch 180/200
6/6 - 2s - loss: 0.1230 - val_loss: 0.2066
Epoch 181/200
6/6 - 2s - loss: 0.1423 - val_loss: 0.1924
Epoch 182/200
6/6 - 2s - loss: 0.1510 - val_loss: 0.1380
Epoch 183/200
6/6 - 2s - loss: 0.1927 - val_loss: 0.1688
Epoch 184/200
6/6 - 2s - loss: 0.2003 - val_loss: 0.2109
Epoch 185/200
6/6 - 2s - loss: 0.1829 - val_loss: 0.2121
Epoch 186/200
6/6 - 2s - loss: 0.1843 - val_loss: 0.1997
Epoch 187/200
6/6 - 2s - loss: 0.1633 - val_loss: 0.1758
Epoch 188/200
6/6 - 2s - loss: 0.1500 - val_loss: 0.1456
Epoch 189/200
6/6 - 2s - loss: 0.1410 - val_loss: 0.1518
Epoch 190/200
6/6 - 2s - loss: 0.1419 - val_loss: 0.1390
Epoch 191/200
6/6 - 2s - loss: 0.1395 - val_loss: 0.1330
Epoch 192/200
6/6 - 2s - loss: 0.1248 - val_loss: 0.1083
Epoch 193/200
6/6 - 2s - loss: 0.1242 - val_loss: 0.1238
Epoch 194/200
6/6 - 2s - loss: 0.1236 - val_loss: 0.1272
Epoch 195/200
6/6 - 2s - loss: 0.1257 - val_loss: 0.1502
Epoch 196/200
6/6 - 2s - loss: 0.1379 - val_loss: 0.1818
Epoch 197/200
6/6 - 2s - loss: 0.1531 - val_loss: 0.1716
Epoch 198/200
6/6 - 2s - loss: 0.1598 - val_loss: 0.1195
Epoch 199/200
6/6 - 2s - loss: 0.1299 - val_loss: 0.1094
Epoch 200/200
6/6 - 2s - loss: 0.1151 - val_loss: 0.1016
```

3it [20:41, 414.37s/it]

```
Epoch 1/200
6/6 - 19s - loss: 0.8648 - val_loss: 0.6245
Epoch 2/200
6/6 - 2s - loss: 0.5806 - val_loss: 0.5396
Epoch 3/200
6/6 - 2s - loss: 0.4981 - val_loss: 0.4683
Epoch 4/200
6/6 - 2s - loss: 0.4401 - val_loss: 0.4156
Epoch 5/200
6/6 - 2s - loss: 0.3982 - val_loss: 0.3798
Epoch 6/200
6/6 - 2s - loss: 0.3645 - val_loss: 0.3666
Epoch 7/200
6/6 - 2s - loss: 0.3481 - val_loss: 0.3748
Epoch 8/200
6/6 - 2s - loss: 0.3683 - val_loss: 0.4138
Epoch 9/200
6/6 - 2s - loss: 0.3445 - val_loss: 0.3330
Epoch 10/200
6/6 - 2s - loss: 0.3202 - val_loss: 0.3436
Epoch 11/200
6/6 - 2s - loss: 0.3051 - val_loss: 0.2949
Epoch 12/200
6/6 - 2s - loss: 0.2931 - val_loss: 0.2895
Epoch 13/200
6/6 - 2s - loss: 0.2749 - val_loss: 0.2862
Epoch 14/200
6/6 - 2s - loss: 0.2651 - val_loss: 0.2648
Epoch 15/200
6/6 - 2s - loss: 0.2563 - val_loss: 0.2571
Epoch 16/200
6/6 - 2s - loss: 0.2597 - val_loss: 0.2543
Epoch 17/200
6/6 - 2s - loss: 0.2458 - val_loss: 0.2430
Epoch 18/200
6/6 - 2s - loss: 0.2359 - val_loss: 0.2356
Epoch 19/200
6/6 - 2s - loss: 0.2297 - val_loss: 0.2308
Epoch 20/200
6/6 - 2s - loss: 0.2215 - val_loss: 0.2243
Epoch 21/200
6/6 - 2s - loss: 0.2200 - val_loss: 0.2336
Epoch 22/200
6/6 - 2s - loss: 0.2209 - val_loss: 0.2591
Epoch 23/200
6/6 - 2s - loss: 0.2492 - val_loss: 0.2204
Epoch 24/200
6/6 - 2s - loss: 0.2219 - val_loss: 0.2570
Epoch 25/200
6/6 - 2s - loss: 0.2309 - val_loss: 0.2386
Epoch 26/200
6/6 - 2s - loss: 0.2415 - val_loss: 0.2165
Epoch 27/200
6/6 - 2s - loss: 0.2033 - val_loss: 0.2010
Epoch 28/200
6/6 - 2s - loss: 0.2053 - val_loss: 0.2056
Epoch 29/200
6/6 - 2s - loss: 0.2046 - val_loss: 0.2032
Epoch 30/200
6/6 - 2s - loss: 0.2000 - val_loss: 0.1930
Epoch 31/200
6/6 - 2s - loss: 0.1947 - val_loss: 0.1946
Epoch 32/200
6/6 - 2s - loss: 0.1963 - val_loss: 0.2074
Epoch 33/200
6/6 - 2s - loss: 0.2060 - val_loss: 0.2127
Epoch 34/200
6/6 - 2s - loss: 0.1977 - val_loss: 0.1904
Epoch 35/200
6/6 - 2s - loss: 0.1881 - val_loss: 0.1986
Epoch 36/200
6/6 - 2s - loss: 0.1936 - val_loss: 0.1884
Epoch 37/200
6/6 - 2s - loss: 0.1746 - val_loss: 0.1772
Epoch 38/200
6/6 - 2s - loss: 0.1825 - val_loss: 0.1866
Epoch 39/200
6/6 - 2s - loss: 0.1763 - val_loss: 0.1732
Epoch 40/200
6/6 - 2s - loss: 0.1723 - val_loss: 0.1876
Epoch 41/200
6/6 - 2s - loss: 0.1863 - val_loss: 0.1809
Epoch 42/200
6/6 - 2s - loss: 0.1639 - val_loss: 0.1830
Epoch 43/200
6/6 - 2s - loss: 0.1700 - val_loss: 0.1555
Epoch 44/200
6/6 - 2s - loss: 0.1880 - val_loss: 0.1678
Epoch 45/200
6/6 - 2s - loss: 0.1646 - val_loss: 0.1609
Epoch 46/200
6/6 - 2s - loss: 0.1582 - val_loss: 0.1572
Epoch 47/200
6/6 - 2s - loss: 0.1598 - val_loss: 0.1709
Epoch 48/200
6/6 - 2s - loss: 0.1688 - val_loss: 0.1711
Epoch 49/200
6/6 - 2s - loss: 0.1589 - val_loss: 0.1524
Epoch 50/200
6/6 - 2s - loss: 0.1674 - val_loss: 0.1509
Epoch 51/200
6/6 - 2s - loss: 0.1488 - val_loss: 0.1396
Epoch 52/200
6/6 - 2s - loss: 0.1512 - val_loss: 0.1409
Epoch 53/200
6/6 - 2s - loss: 0.1423 - val_loss: 0.1418
Epoch 54/200
6/6 - 2s - loss: 0.1382 - val_loss: 0.1258
Epoch 55/200
6/6 - 2s - loss: 0.1556 - val_loss: 0.1264
Epoch 56/200
6/6 - 2s - loss: 0.1455 - val_loss: 0.1287
Epoch 57/200
6/6 - 2s - loss: 0.1402 - val_loss: 0.1521
Epoch 58/200
6/6 - 2s - loss: 0.1410 - val_loss: 0.1297
Epoch 59/200
6/6 - 2s - loss: 0.1400 - val_loss: 0.1235
Epoch 60/200
6/6 - 2s - loss: 0.1354 - val_loss: 0.1544
Epoch 61/200
6/6 - 2s - loss: 0.1662 - val_loss: 0.2342
Epoch 62/200
6/6 - 2s - loss: 0.1909 - val_loss: 0.1539
Epoch 63/200
6/6 - 2s - loss: 0.1374 - val_loss: 0.1290
Epoch 64/200
6/6 - 2s - loss: 0.1434 - val_loss: 0.1409
Epoch 65/200
6/6 - 2s - loss: 0.1367 - val_loss: 0.1226
Epoch 66/200
6/6 - 2s - loss: 0.1300 - val_loss: 0.1219
Epoch 67/200
6/6 - 2s - loss: 0.1248 - val_loss: 0.1608
Epoch 68/200
6/6 - 2s - loss: 0.1309 - val_loss: 0.1165
Epoch 69/200
6/6 - 2s - loss: 0.1312 - val_loss: 0.1224
Epoch 70/200
6/6 - 2s - loss: 0.1279 - val_loss: 0.1301
Epoch 71/200
6/6 - 2s - loss: 0.1143 - val_loss: 0.1228
Epoch 72/200
6/6 - 2s - loss: 0.1262 - val_loss: 0.1065
Epoch 73/200
6/6 - 2s - loss: 0.1269 - val_loss: 0.1176
Epoch 74/200
6/6 - 2s - loss: 0.1160 - val_loss: 0.1164
Epoch 75/200
6/6 - 2s - loss: 0.1200 - val_loss: 0.1097
Epoch 76/200
6/6 - 2s - loss: 0.1147 - val_loss: 0.1083
Epoch 77/200
6/6 - 2s - loss: 0.1192 - val_loss: 0.1075
Epoch 78/200
6/6 - 2s - loss: 0.1158 - val_loss: 0.1223
Epoch 79/200
6/6 - 2s - loss: 0.1117 - val_loss: 0.1104
Epoch 80/200
6/6 - 2s - loss: 0.1186 - val_loss: 0.1085
Epoch 81/200
6/6 - 2s - loss: 0.1172 - val_loss: 0.1445
Epoch 82/200
6/6 - 2s - loss: 0.1162 - val_loss: 0.1282
Epoch 83/200
6/6 - 2s - loss: 0.1217 - val_loss: 0.1218
Epoch 84/200
6/6 - 2s - loss: 0.1189 - val_loss: 0.1260
Epoch 85/200
6/6 - 2s - loss: 0.1258 - val_loss: 0.1328
Epoch 86/200
6/6 - 2s - loss: 0.1277 - val_loss: 0.1552
Epoch 87/200
6/6 - 2s - loss: 0.1335 - val_loss: 0.1231
Epoch 88/200
6/6 - 2s - loss: 0.1350 - val_loss: 0.2025
Epoch 89/200
6/6 - 2s - loss: 0.1609 - val_loss: 0.1405
Epoch 90/200
6/6 - 2s - loss: 0.1275 - val_loss: 0.1264
Epoch 91/200
6/6 - 2s - loss: 0.1245 - val_loss: 0.1237
Epoch 92/200
6/6 - 2s - loss: 0.1210 - val_loss: 0.1171
Epoch 93/200
6/6 - 2s - loss: 0.1194 - val_loss: 0.1173
Epoch 94/200
6/6 - 2s - loss: 0.1150 - val_loss: 0.1220
Epoch 95/200
6/6 - 2s - loss: 0.1098 - val_loss: 0.1118
Epoch 96/200
6/6 - 2s - loss: 0.1154 - val_loss: 0.1465
Epoch 97/200
6/6 - 2s - loss: 0.1132 - val_loss: 0.1094
Epoch 98/200
6/6 - 2s - loss: 0.1257 - val_loss: 0.1348
Epoch 99/200
6/6 - 2s - loss: 0.1228 - val_loss: 0.1339
Epoch 100/200
6/6 - 2s - loss: 0.1260 - val_loss: 0.1300
Epoch 101/200
6/6 - 2s - loss: 0.1346 - val_loss: 0.1236
Epoch 102/200
6/6 - 2s - loss: 0.1174 - val_loss: 0.1337
Epoch 103/200
6/6 - 2s - loss: 0.1110 - val_loss: 0.1270
Epoch 104/200
6/6 - 2s - loss: 0.1058 - val_loss: 0.1216
Epoch 105/200
6/6 - 2s - loss: 0.1176 - val_loss: 0.1116
Epoch 106/200
6/6 - 2s - loss: 0.1154 - val_loss: 0.1304
Epoch 107/200
6/6 - 2s - loss: 0.1117 - val_loss: 0.1045
Epoch 108/200
6/6 - 2s - loss: 0.1071 - val_loss: 0.1063
Epoch 109/200
6/6 - 2s - loss: 0.1057 - val_loss: 0.1002
Epoch 110/200
6/6 - 2s - loss: 0.1027 - val_loss: 0.1002
Epoch 111/200
6/6 - 2s - loss: 0.1091 - val_loss: 0.1308
Epoch 112/200
6/6 - 2s - loss: 0.1036 - val_loss: 0.1291
Epoch 113/200
6/6 - 2s - loss: 0.1087 - val_loss: 0.1211
Epoch 114/200
6/6 - 2s - loss: 0.1075 - val_loss: 0.1161
Epoch 115/200
6/6 - 2s - loss: 0.1212 - val_loss: 0.2096
Epoch 116/200
6/6 - 2s - loss: 0.1477 - val_loss: 0.1339
Epoch 117/200
6/6 - 2s - loss: 0.1057 - val_loss: 0.1186
Epoch 118/200
6/6 - 2s - loss: 0.1112 - val_loss: 0.1122
Epoch 119/200
6/6 - 2s - loss: 0.1117 - val_loss: 0.1183
Epoch 120/200
6/6 - 2s - loss: 0.1130 - val_loss: 0.1117
Epoch 121/200
6/6 - 2s - loss: 0.1056 - val_loss: 0.1236
Epoch 122/200
6/6 - 2s - loss: 0.1057 - val_loss: 0.1212
Epoch 123/200
6/6 - 2s - loss: 0.1148 - val_loss: 0.1049
Epoch 124/200
6/6 - 2s - loss: 0.1057 - val_loss: 0.0980
Epoch 125/200
6/6 - 2s - loss: 0.1067 - val_loss: 0.1457
Epoch 126/200
6/6 - 2s - loss: 0.1087 - val_loss: 0.1118
Epoch 127/200
6/6 - 2s - loss: 0.1077 - val_loss: 0.1183
Epoch 128/200
6/6 - 2s - loss: 0.1019 - val_loss: 0.1068
Epoch 129/200
6/6 - 2s - loss: 0.1013 - val_loss: 0.1077
Epoch 130/200
6/6 - 2s - loss: 0.0972 - val_loss: 0.1276
Epoch 131/200
6/6 - 2s - loss: 0.1052 - val_loss: 0.1067
Epoch 132/200
6/6 - 2s - loss: 0.1050 - val_loss: 0.1077
Epoch 133/200
6/6 - 2s - loss: 0.1060 - val_loss: 0.1045
Epoch 134/200
6/6 - 2s - loss: 0.0986 - val_loss: 0.1453
Epoch 135/200
6/6 - 2s - loss: 0.1007 - val_loss: 0.1153
Epoch 136/200
6/6 - 2s - loss: 0.0988 - val_loss: 0.1021
Epoch 137/200
6/6 - 2s - loss: 0.1053 - val_loss: 0.1290
Epoch 138/200
6/6 - 2s - loss: 0.1055 - val_loss: 0.1390
Epoch 139/200
6/6 - 2s - loss: 0.1059 - val_loss: 0.1140
Epoch 140/200
6/6 - 2s - loss: 0.1078 - val_loss: 0.1359
Epoch 141/200
6/6 - 2s - loss: 0.1031 - val_loss: 0.1209
Epoch 142/200
6/6 - 2s - loss: 0.1221 - val_loss: 0.1629
Epoch 143/200
6/6 - 2s - loss: 0.1228 - val_loss: 0.1524
Epoch 144/200
6/6 - 2s - loss: 0.1098 - val_loss: 0.1458
Epoch 145/200
6/6 - 2s - loss: 0.1157 - val_loss: 0.1418
Epoch 146/200
6/6 - 2s - loss: 0.1061 - val_loss: 0.1274
Epoch 147/200
6/6 - 2s - loss: 0.1131 - val_loss: 0.1274
Epoch 148/200
6/6 - 2s - loss: 0.1067 - val_loss: 0.1224
Epoch 149/200
6/6 - 2s - loss: 0.1062 - val_loss: 0.1154
Epoch 150/200
6/6 - 2s - loss: 0.0984 - val_loss: 0.1625
Epoch 151/200
6/6 - 2s - loss: 0.1078 - val_loss: 0.1281
Epoch 152/200
6/6 - 2s - loss: 0.0991 - val_loss: 0.1228
Epoch 153/200
6/6 - 2s - loss: 0.0964 - val_loss: 0.1232
Epoch 154/200
6/6 - 2s - loss: 0.0940 - val_loss: 0.1204
Epoch 155/200
6/6 - 2s - loss: 0.0968 - val_loss: 0.1119
Epoch 156/200
6/6 - 2s - loss: 0.0938 - val_loss: 0.1137
Epoch 157/200
6/6 - 2s - loss: 0.0995 - val_loss: 0.1465
Epoch 158/200
6/6 - 2s - loss: 0.1013 - val_loss: 0.1104
Epoch 159/200
6/6 - 2s - loss: 0.0982 - val_loss: 0.1427
Epoch 160/200
6/6 - 2s - loss: 0.0978 - val_loss: 0.1491
Epoch 161/200
6/6 - 2s - loss: 0.1006 - val_loss: 0.1091
Epoch 162/200
6/6 - 2s - loss: 0.0975 - val_loss: 0.1235
Epoch 163/200
6/6 - 2s - loss: 0.0979 - val_loss: 0.1166
Epoch 164/200
6/6 - 2s - loss: 0.1053 - val_loss: 0.1306
Epoch 165/200
6/6 - 2s - loss: 0.1018 - val_loss: 0.1314
Epoch 166/200
6/6 - 2s - loss: 0.1024 - val_loss: 0.1250
Epoch 167/200
6/6 - 2s - loss: 0.0957 - val_loss: 0.1385
Epoch 168/200
6/6 - 2s - loss: 0.1111 - val_loss: 0.2095
Epoch 169/200
6/6 - 2s - loss: 0.1285 - val_loss: 0.1582
Epoch 170/200
6/6 - 2s - loss: 0.1140 - val_loss: 0.1643
Epoch 171/200
6/6 - 2s - loss: 0.1182 - val_loss: 0.1549
Epoch 172/200
6/6 - 2s - loss: 0.1085 - val_loss: 0.1622
Epoch 173/200
6/6 - 2s - loss: 0.1091 - val_loss: 0.1595
Epoch 174/200
6/6 - 2s - loss: 0.1122 - val_loss: 0.1926
Epoch 175/200
6/6 - 2s - loss: 0.1500 - val_loss: 0.1768
Epoch 176/200
6/6 - 2s - loss: 0.1842 - val_loss: 0.1677
Epoch 177/200
6/6 - 2s - loss: 0.1986 - val_loss: 0.2007
Epoch 178/200
6/6 - 2s - loss: 0.1856 - val_loss: 0.2082
Epoch 179/200
6/6 - 2s - loss: 0.1815 - val_loss: 0.2225
Epoch 180/200
6/6 - 2s - loss: 0.1810 - val_loss: 0.1919
Epoch 181/200
6/6 - 2s - loss: 0.1689 - val_loss: 0.1670
Epoch 182/200
6/6 - 2s - loss: 0.1548 - val_loss: 0.1426
Epoch 183/200
6/6 - 2s - loss: 0.1355 - val_loss: 0.1352
Epoch 184/200
6/6 - 2s - loss: 0.1271 - val_loss: 0.1123
Epoch 185/200
6/6 - 2s - loss: 0.1185 - val_loss: 0.0958
Epoch 186/200
6/6 - 2s - loss: 0.1181 - val_loss: 0.1065
Epoch 187/200
6/6 - 2s - loss: 0.1303 - val_loss: 0.1003
Epoch 188/200
6/6 - 2s - loss: 0.1388 - val_loss: 0.1479
Epoch 189/200
6/6 - 2s - loss: 0.1531 - val_loss: 0.2103
Epoch 190/200
6/6 - 2s - loss: 0.1753 - val_loss: 0.1751
Epoch 191/200
6/6 - 2s - loss: 0.1806 - val_loss: 0.1274
Epoch 192/200
6/6 - 2s - loss: 0.1149 - val_loss: 0.1000
Epoch 193/200
6/6 - 2s - loss: 0.0957 - val_loss: 0.0920
Epoch 194/200
6/6 - 2s - loss: 0.1040 - val_loss: 0.0997
Epoch 195/200
6/6 - 2s - loss: 0.1198 - val_loss: 0.0992
Epoch 196/200
6/6 - 2s - loss: 0.1330 - val_loss: 0.1437
Epoch 197/200
6/6 - 2s - loss: 0.1357 - val_loss: 0.1773
Epoch 198/200
6/6 - 2s - loss: 0.1537 - val_loss: 0.1615
Epoch 199/200
6/6 - 2s - loss: 0.1478 - val_loss: 0.1074
Epoch 200/200
6/6 - 2s - loss: 0.1185 - val_loss: 0.1040
```

4it [27:24, 410.96s/it]

```
Epoch 1/200
6/6 - 15s - loss: 0.8877 - val_loss: 0.6372
Epoch 2/200
6/6 - 2s - loss: 0.5892 - val_loss: 0.5527
Epoch 3/200
6/6 - 2s - loss: 0.5026 - val_loss: 0.5106
Epoch 4/200
6/6 - 2s - loss: 0.4607 - val_loss: 0.4307
Epoch 5/200
6/6 - 2s - loss: 0.4100 - val_loss: 0.4245
Epoch 6/200
6/6 - 2s - loss: 0.4035 - val_loss: 0.3884
```

```
Epoch 7/200
6/6 - 2s - loss: 0.3715 - val_loss: 0.3601
Epoch 8/200
6/6 - 2s - loss: 0.3554 - val_loss: 0.3480
Epoch 9/200
6/6 - 2s - loss: 0.3298 - val_loss: 0.3264
Epoch 10/200
6/6 - 2s - loss: 0.3237 - val_loss: 0.3151
Epoch 11/200
6/6 - 2s - loss: 0.3078 - val_loss: 0.3119
Epoch 12/200
6/6 - 2s - loss: 0.2940 - val_loss: 0.2912
Epoch 13/200
6/6 - 2s - loss: 0.2790 - val_loss: 0.2804
Epoch 14/200
6/6 - 2s - loss: 0.2695 - val_loss: 0.2819
Epoch 15/200
6/6 - 2s - loss: 0.2839 - val_loss: 0.2612
Epoch 16/200
6/6 - 2s - loss: 0.2828 - val_loss: 0.2849
Epoch 17/200
6/6 - 2s - loss: 0.2846 - val_loss: 0.3024
Epoch 18/200
6/6 - 2s - loss: 0.2558 - val_loss: 0.2556
Epoch 19/200
6/6 - 2s - loss: 0.2513 - val_loss: 0.2571
Epoch 20/200
6/6 - 2s - loss: 0.2368 - val_loss: 0.2363
Epoch 21/200
6/6 - 2s - loss: 0.2307 - val_loss: 0.2334
Epoch 22/200
6/6 - 2s - loss: 0.2243 - val_loss: 0.2197
Epoch 23/200
6/6 - 2s - loss: 0.2181 - val_loss: 0.2278
Epoch 24/200
6/6 - 2s - loss: 0.2239 - val_loss: 0.2483
Epoch 25/200
6/6 - 2s - loss: 0.2376 - val_loss: 0.2508
Epoch 26/200
6/6 - 2s - loss: 0.2205 - val_loss: 0.2216
Epoch 27/200
6/6 - 2s - loss: 0.2239 - val_loss: 0.2065
Epoch 28/200
6/6 - 2s - loss: 0.2032 - val_loss: 0.1996
Epoch 29/200
6/6 - 2s - loss: 0.1942 - val_loss: 0.1921
Epoch 30/200
6/6 - 2s - loss: 0.1970 - val_loss: 0.1934
Epoch 31/200
6/6 - 2s - loss: 0.1974 - val_loss: 0.1959
Epoch 32/200
6/6 - 2s - loss: 0.2001 - val_loss: 0.1765
Epoch 33/200
6/6 - 2s - loss: 0.1919 - val_loss: 0.1772
Epoch 34/200
6/6 - 2s - loss: 0.1955 - val_loss: 0.1864
Epoch 35/200
6/6 - 2s - loss: 0.1928 - val_loss: 0.2093
Epoch 36/200
6/6 - 2s - loss: 0.2057 - val_loss: 0.1899
Epoch 37/200
6/6 - 9883s - loss: 0.1808 - val_loss: 0.1722
Epoch 38/200
6/6 - 3s - loss: 0.1790 - val_loss: 0.1661
Epoch 39/200
6/6 - 3s - loss: 0.1740 - val_loss: 0.1810
Epoch 40/200
6/6 - 3s - loss: 0.1890 - val_loss: 0.1762
Epoch 41/200
6/6 - 3s - loss: 0.1821 - val_loss: 0.1660
Epoch 42/200
6/6 - 2s - loss: 0.1770 - val_loss: 0.1712
Epoch 43/200
6/6 - 2s - loss: 0.1717 - val_loss: 0.1627
Epoch 44/200
6/6 - 2s - loss: 0.1706 - val_loss: 0.1534
Epoch 45/200
6/6 - 2s - loss: 0.1640 - val_loss: 0.1558
Epoch 46/200
6/6 - 2s - loss: 0.1567 - val_loss: 0.1502
Epoch 47/200
6/6 - 2s - loss: 0.1592 - val_loss: 0.1424
Epoch 48/200
6/6 - 2s - loss: 0.1539 - val_loss: 0.1683
Epoch 49/200
6/6 - 2s - loss: 0.1637 - val_loss: 0.1483
Epoch 50/200
6/6 - 2s - loss: 0.1645 - val_loss: 0.1428
Epoch 51/200
6/6 - 2s - loss: 0.1690 - val_loss: 0.1508
Epoch 52/200
6/6 - 2s - loss: 0.1490 - val_loss: 0.1558
Epoch 53/200
6/6 - 2s - loss: 0.1501 - val_loss: 0.1444
Epoch 54/200
6/6 - 2s - loss: 0.1653 - val_loss: 0.1603
Epoch 55/200
6/6 - 3s - loss: 0.1767 - val_loss: 0.2721
Epoch 56/200
6/6 - 2s - loss: 0.2076 - val_loss: 0.1464
Epoch 57/200
6/6 - 4s - loss: 0.1538 - val_loss: 0.1415
Epoch 58/200
6/6 - 3s - loss: 0.1537 - val_loss: 0.1402
Epoch 59/200
6/6 - 2s - loss: 0.1481 - val_loss: 0.1342
Epoch 60/200
6/6 - 2s - loss: 0.1325 - val_loss: 0.1369
Epoch 61/200
6/6 - 2s - loss: 0.1462 - val_loss: 0.1739
Epoch 62/200
6/6 - 2s - loss: 0.1420 - val_loss: 0.1370
Epoch 63/200
6/6 - 2s - loss: 0.1412 - val_loss: 0.1258
Epoch 64/200
6/6 - 2s - loss: 0.1298 - val_loss: 0.1216
Epoch 65/200
6/6 - 2s - loss: 0.1290 - val_loss: 0.1208
Epoch 66/200
6/6 - 2s - loss: 0.1253 - val_loss: 0.1269
Epoch 67/200
6/6 - 3s - loss: 0.1294 - val_loss: 0.1146
Epoch 68/200
6/6 - 2s - loss: 0.1307 - val_loss: 0.1189
Epoch 69/200
6/6 - 2s - loss: 0.1361 - val_loss: 0.1273
Epoch 70/200
6/6 - 2s - loss: 0.1306 - val_loss: 0.1344
Epoch 71/200
6/6 - 2s - loss: 0.1301 - val_loss: 0.1399
Epoch 72/200
6/6 - 2s - loss: 0.1339 - val_loss: 0.1294
Epoch 73/200
6/6 - 2s - loss: 0.1385 - val_loss: 0.1324
Epoch 74/200
6/6 - 2s - loss: 0.1342 - val_loss: 0.1425
Epoch 75/200
6/6 - 2s - loss: 0.1327 - val_loss: 0.1299
Epoch 76/200
6/6 - 2s - loss: 0.1381 - val_loss: 0.1198
Epoch 77/200
6/6 - 2s - loss: 0.1269 - val_loss: 0.1336
Epoch 78/200
6/6 - 2s - loss: 0.1343 - val_loss: 0.1339
Epoch 79/200
6/6 - 2s - loss: 0.1304 - val_loss: 0.1247
Epoch 80/200
6/6 - 2s - loss: 0.1359 - val_loss: 0.1233
Epoch 81/200
6/6 - 2s - loss: 0.1286 - val_loss: 0.1314
Epoch 82/200
6/6 - 3s - loss: 0.1234 - val_loss: 0.1307
Epoch 83/200
6/6 - 2s - loss: 0.1346 - val_loss: 0.1159
Epoch 84/200
6/6 - 2s - loss: 0.1279 - val_loss: 0.1118
Epoch 85/200
6/6 - 2s - loss: 0.1224 - val_loss: 0.1138
Epoch 86/200
6/6 - 2s - loss: 0.1166 - val_loss: 0.1077
Epoch 87/200
6/6 - 2s - loss: 0.1228 - val_loss: 0.1201
Epoch 88/200
6/6 - 2s - loss: 0.1243 - val_loss: 0.1162
Epoch 89/200
6/6 - 2s - loss: 0.1154 - val_loss: 0.1104
Epoch 90/200
6/6 - 2s - loss: 0.1121 - val_loss: 0.1043
Epoch 91/200
6/6 - 2s - loss: 0.1125 - val_loss: 0.1086
Epoch 92/200
6/6 - 2s - loss: 0.1221 - val_loss: 0.1095
Epoch 93/200
6/6 - 2s - loss: 0.1156 - val_loss: 0.1233
Epoch 94/200
6/6 - 2s - loss: 0.1133 - val_loss: 0.1309
Epoch 95/200
6/6 - 2s - loss: 0.1199 - val_loss: 0.1139
Epoch 96/200
6/6 - 2s - loss: 0.1256 - val_loss: 0.1088
Epoch 97/200
6/6 - 2s - loss: 0.1259 - val_loss: 0.1226
Epoch 98/200
6/6 - 2s - loss: 0.1166 - val_loss: 0.1336
Epoch 99/200
6/6 - 2s - loss: 0.1131 - val_loss: 0.1317
Epoch 100/200
6/6 - 2s - loss: 0.1138 - val_loss: 0.1161
Epoch 101/200
6/6 - 2s - loss: 0.1202 - val_loss: 0.1183
Epoch 102/200
6/6 - 2s - loss: 0.1371 - val_loss: 0.2275
Epoch 103/200
6/6 - 3s - loss: 0.1485 - val_loss: 0.1086
Epoch 104/200
6/6 - 3s - loss: 0.1231 - val_loss: 0.1225
Epoch 105/200
6/6 - 2s - loss: 0.1217 - val_loss: 0.1068
Epoch 106/200
6/6 - 2s - loss: 0.1190 - val_loss: 0.1364
Epoch 107/200
6/6 - 2s - loss: 0.1132 - val_loss: 0.1165
Epoch 108/200
6/6 - 3s - loss: 0.1161 - val_loss: 0.1043
Epoch 109/200
6/6 - 2s - loss: 0.1175 - val_loss: 0.1169
Epoch 110/200
6/6 - 2s - loss: 0.1179 - val_loss: 0.1199
Epoch 111/200
6/6 - 2s - loss: 0.1104 - val_loss: 0.1147
Epoch 112/200
6/6 - 2s - loss: 0.1172 - val_loss: 0.1094
Epoch 113/200
6/6 - 2s - loss: 0.1182 - val_loss: 0.1108
Epoch 114/200
6/6 - 2s - loss: 0.1067 - val_loss: 0.1058
Epoch 115/200
6/6 - 3s - loss: 0.1052 - val_loss: 0.1072
Epoch 116/200
6/6 - 2s - loss: 0.1005 - val_loss: 0.1091
Epoch 117/200
6/6 - 3s - loss: 0.1104 - val_loss: 0.1011
Epoch 118/200
6/6 - 2s - loss: 0.1013 - val_loss: 0.0984
Epoch 119/200
6/6 - 2s - loss: 0.1093 - val_loss: 0.1039
Epoch 120/200
6/6 - 2s - loss: 0.1013 - val_loss: 0.1331
Epoch 121/200
6/6 - 2s - loss: 0.1041 - val_loss: 0.1166
Epoch 122/200
6/6 - 2s - loss: 0.1021 - val_loss: 0.0971
Epoch 123/200
6/6 - 2s - loss: 0.1181 - val_loss: 0.1068
Epoch 124/200
6/6 - 2s - loss: 0.1003 - val_loss: 0.1143
Epoch 125/200
6/6 - 2s - loss: 0.1008 - val_loss: 0.0972
Epoch 126/200
6/6 - 2s - loss: 0.1046 - val_loss: 0.0997
Epoch 127/200
6/6 - 2s - loss: 0.0955 - val_loss: 0.1266
Epoch 128/200
6/6 - 2s - loss: 0.0979 - val_loss: 0.1080
Epoch 129/200
6/6 - 2s - loss: 0.1041 - val_loss: 0.0940
Epoch 130/200
6/6 - 2s - loss: 0.1060 - val_loss: 0.1043
Epoch 131/200
6/6 - 2s - loss: 0.0973 - val_loss: 0.1102
Epoch 132/200
6/6 - 2s - loss: 0.1006 - val_loss: 0.1012
Epoch 133/200
6/6 - 3s - loss: 0.1031 - val_loss: 0.1106
Epoch 134/200
6/6 - 2s - loss: 0.1070 - val_loss: 0.1092
Epoch 135/200
6/6 - 3s - loss: 0.1007 - val_loss: 0.1122
Epoch 136/200
6/6 - 2s - loss: 0.1003 - val_loss: 0.1295
Epoch 137/200
6/6 - 2s - loss: 0.1078 - val_loss: 0.1000
Epoch 138/200
6/6 - 2s - loss: 0.1147 - val_loss: 0.0988
Epoch 139/200
6/6 - 2s - loss: 0.1075 - val_loss: 0.1934
Epoch 140/200
6/6 - 2s - loss: 0.1245 - val_loss: 0.1047
Epoch 141/200
6/6 - 2s - loss: 0.1217 - val_loss: 0.2108
Epoch 142/200
6/6 - 2s - loss: 0.1463 - val_loss: 0.1300
Epoch 143/200
6/6 - 2s - loss: 0.1086 - val_loss: 0.1217
Epoch 144/200
6/6 - 2s - loss: 0.1203 - val_loss: 0.1140
Epoch 145/200
6/6 - 2s - loss: 0.0989 - val_loss: 0.1115
Epoch 146/200
6/6 - 2s - loss: 0.0956 - val_loss: 0.0976
Epoch 147/200
6/6 - 2s - loss: 0.0941 - val_loss: 0.1049
Epoch 148/200
6/6 - 2s - loss: 0.0944 - val_loss: 0.1024
Epoch 149/200
6/6 - 2s - loss: 0.0951 - val_loss: 0.1096
Epoch 150/200
6/6 - 2s - loss: 0.0900 - val_loss: 0.0902
Epoch 151/200
6/6 - 2s - loss: 0.0972 - val_loss: 0.0974
Epoch 152/200
6/6 - 2s - loss: 0.0921 - val_loss: 0.1228
Epoch 153/200
6/6 - 2s - loss: 0.0898 - val_loss: 0.1005
Epoch 154/200
6/6 - 2s - loss: 0.0983 - val_loss: 0.0997
Epoch 155/200
6/6 - 2s - loss: 0.0985 - val_loss: 0.1374
Epoch 156/200
6/6 - 2s - loss: 0.1005 - val_loss: 0.1289
Epoch 157/200
6/6 - 2s - loss: 0.0950 - val_loss: 0.0960
Epoch 158/200
6/6 - 2s - loss: 0.0985 - val_loss: 0.1108
Epoch 159/200
6/6 - 2s - loss: 0.0977 - val_loss: 0.1224
Epoch 160/200
6/6 - 2s - loss: 0.0966 - val_loss: 0.1462
Epoch 161/200
6/6 - 2s - loss: 0.1002 - val_loss: 0.1140
Epoch 162/200
6/6 - 2s - loss: 0.1001 - val_loss: 0.1166
Epoch 163/200
6/6 - 2s - loss: 0.1042 - val_loss: 0.1354
Epoch 164/200
6/6 - 2s - loss: 0.1194 - val_loss: 0.1459
Epoch 165/200
6/6 - 2s - loss: 0.1100 - val_loss: 0.1121
Epoch 166/200
6/6 - 2s - loss: 0.1071 - val_loss: 0.1137
Epoch 167/200
6/6 - 2s - loss: 0.1043 - val_loss: 0.1492
Epoch 168/200
6/6 - 2s - loss: 0.1052 - val_loss: 0.1245
Epoch 169/200
6/6 - 2s - loss: 0.0970 - val_loss: 0.1298
Epoch 170/200
6/6 - 2s - loss: 0.1058 - val_loss: 0.1133
Epoch 171/200
6/6 - 2s - loss: 0.0963 - val_loss: 0.1381
Epoch 172/200
6/6 - 2s - loss: 0.1037 - val_loss: 0.1336
Epoch 173/200
6/6 - 2s - loss: 0.0984 - val_loss: 0.1167
Epoch 174/200
6/6 - 2s - loss: 0.1044 - val_loss: 0.1223
Epoch 175/200
6/6 - 2s - loss: 0.0961 - val_loss: 0.1267
Epoch 176/200
6/6 - 2s - loss: 0.0990 - val_loss: 0.1174
Epoch 177/200
6/6 - 2s - loss: 0.1007 - val_loss: 0.1482
Epoch 178/200
6/6 - 2s - loss: 0.1113 - val_loss: 0.1432
Epoch 179/200
6/6 - 2s - loss: 0.1018 - val_loss: 0.1347
Epoch 180/200
6/6 - 2s - loss: 0.1086 - val_loss: 0.1612
Epoch 181/200
6/6 - 2s - loss: 0.1115 - val_loss: 0.1143
Epoch 182/200
6/6 - 2s - loss: 0.1035 - val_loss: 0.1805
Epoch 183/200
6/6 - 2s - loss: 0.1219 - val_loss: 0.1591
Epoch 184/200
6/6 - 2s - loss: 0.1139 - val_loss: 0.1654
Epoch 185/200
6/6 - 2s - loss: 0.1068 - val_loss: 0.1391
Epoch 186/200
6/6 - 2s - loss: 0.1023 - val_loss: 0.1548
Epoch 187/200
6/6 - 2s - loss: 0.1139 - val_loss: 0.1918
Epoch 188/200
6/6 - 2s - loss: 0.1289 - val_loss: 0.2012
Epoch 189/200
6/6 - 2s - loss: 0.1626 - val_loss: 0.1208
Epoch 190/200
6/6 - 2s - loss: 0.2061 - val_loss: 0.2933
Epoch 191/200
6/6 - 2s - loss: 0.2305 - val_loss: 0.1984
Epoch 192/200
6/6 - 2s - loss: 0.1796 - val_loss: 0.1687
Epoch 193/200
6/6 - 2s - loss: 0.1544 - val_loss: 0.1430
Epoch 194/200
6/6 - 2s - loss: 0.1464 - val_loss: 0.1233
Epoch 195/200
6/6 - 2s - loss: 0.1431 - val_loss: 0.1520
Epoch 196/200
6/6 - 3s - loss: 0.1470 - val_loss: 0.1613
Epoch 197/200
6/6 - 3s - loss: 0.1491 - val_loss: 0.1860
Epoch 198/200
6/6 - 3s - loss: 0.1558 - val_loss: 0.1824
Epoch 199/200
6/6 - 2s - loss: 0.1705 - val_loss: 0.1377
Epoch 200/200
6/6 - 2s - loss: 0.1558 - val_loss: 0.1096
```

```
5it [3:19:35, 3387.04s/it]
```

```
Epoch 1/200
6/6 - 18s - loss: 0.9414 - val_loss: 0.6481
Epoch 2/200
6/6 - 2s - loss: 0.6031 - val_loss: 0.5586
Epoch 3/200
6/6 - 2s - loss: 0.5238 - val_loss: 0.4988
Epoch 4/200
6/6 - 2s - loss: 0.4861 - val_loss: 0.4714
Epoch 5/200
6/6 - 2s - loss: 0.4410 - val_loss: 0.4350
Epoch 6/200
6/6 - 2s - loss: 0.4141 - val_loss: 0.3926
Epoch 7/200
6/6 - 2s - loss: 0.3699 - val_loss: 0.3708
Epoch 8/200
6/6 - 2s - loss: 0.3566 - val_loss: 0.3487
Epoch 9/200
6/6 - 2s - loss: 0.3313 - val_loss: 0.3320
Epoch 10/200
6/6 - 2s - loss: 0.3167 - val_loss: 0.3219
Epoch 11/200
6/6 - 2s - loss: 0.3064 - val_loss: 0.3234
Epoch 12/200
6/6 - 2s - loss: 0.3101 - val_loss: 0.3166
Epoch 13/200
6/6 - 2s - loss: 0.3107 - val_loss: 0.3103
Epoch 14/200
6/6 - 2s - loss: 0.2952 - val_loss: 0.2823
Epoch 15/200
6/6 - 2s - loss: 0.2759 - val_loss: 0.2791
Epoch 16/200
6/6 - 3s - loss: 0.2659 - val_loss: 0.2766
Epoch 17/200
6/6 - 2s - loss: 0.2595 - val_loss: 0.2620
Epoch 18/200
6/6 - 2s - loss: 0.2443 - val_loss: 0.2445
Epoch 19/200
6/6 - 2s - loss: 0.2358 - val_loss: 0.2345
Epoch 20/200
6/6 - 2s - loss: 0.2278 - val_loss: 0.2320
Epoch 21/200
6/6 - 2s - loss: 0.2261 - val_loss: 0.2264
Epoch 22/200
6/6 - 2s - loss: 0.2339 - val_loss: 0.2405
Epoch 23/200
6/6 - 2s - loss: 0.2291 - val_loss: 0.2376
Epoch 24/200
6/6 - 2s - loss: 0.2292 - val_loss: 0.2098
Epoch 25/200
6/6 - 2s - loss: 0.2087 - val_loss: 0.2205
Epoch 26/200
6/6 - 2s - loss: 0.2083 - val_loss: 0.2058
Epoch 27/200
6/6 - 2s - loss: 0.2188 - val_loss: 0.2255
Epoch 28/200
6/6 - 2s - loss: 0.2251 - val_loss: 0.2169
Epoch 29/200
6/6 - 3s - loss: 0.2107 - val_loss: 0.1947
Epoch 30/200
6/6 - 3s - loss: 0.1951 - val_loss: 0.1937
Epoch 31/200
6/6 - 3s - loss: 0.1974 - val_loss: 0.1811
Epoch 32/200
6/6 - 3s - loss: 0.1844 - val_loss: 0.1795
Epoch 33/200
6/6 - 3s - loss: 0.1840 - val_loss: 0.1758
Epoch 34/200
6/6 - 2s - loss: 0.1865 - val_loss: 0.1970
Epoch 35/200
6/6 - 2s - loss: 0.1966 - val_loss: 0.2030
Epoch 36/200
6/6 - 2s - loss: 0.1836 - val_loss: 0.1736
Epoch 37/200
6/6 - 2s - loss: 0.1909 - val_loss: 0.2017
Epoch 38/200
6/6 - 2s - loss: 0.2044 - val_loss: 0.2238
Epoch 39/200
6/6 - 2s - loss: 0.1958 - val_loss: 0.1686
Epoch 40/200
6/6 - 2s - loss: 0.1794 - val_loss: 0.1844
Epoch 41/200
6/6 - 3s - loss: 0.1756 - val_loss: 0.1873
Epoch 42/200
6/6 - 3s - loss: 0.1857 - val_loss: 0.2001
Epoch 43/200
6/6 - 2s - loss: 0.1766 - val_loss: 0.1581
Epoch 44/200
6/6 - 2s - loss: 0.1752 - val_loss: 0.1582
Epoch 45/200
6/6 - 2s - loss: 0.1784 - val_loss: 0.1668
Epoch 46/200
6/6 - 2s - loss: 0.1643 - val_loss: 0.1593
Epoch 47/200
6/6 - 2s - loss: 0.1590 - val_loss: 0.1519
Epoch 48/200
6/6 - 2s - loss: 0.1673 - val_loss: 0.1598
Epoch 49/200
6/6 - 2s - loss: 0.1495 - val_loss: 0.1454
Epoch 50/200
6/6 - 2s - loss: 0.1552 - val_loss: 0.1378
Epoch 51/200
6/6 - 2s - loss: 0.1538 - val_loss: 0.1409
Epoch 52/200
6/6 - 2s - loss: 0.1570 - val_loss: 0.1514
Epoch 53/200
6/6 - 2s - loss: 0.1427 - val_loss: 0.1605
Epoch 54/200
6/6 - 2s - loss: 0.1530 - val_loss: 0.1487
Epoch 55/200
6/6 - 2s - loss: 0.1708 - val_loss: 0.2032
Epoch 56/200
6/6 - 2s - loss: 0.1693 - val_loss: 0.1642
Epoch 57/200
6/6 - 2s - loss: 0.1692 - val_loss: 0.1879
Epoch 58/200
6/6 - 2s - loss: 0.1664 - val_loss: 0.1418
Epoch 59/200
6/6 - 2s - loss: 0.1444 - val_loss: 0.1761
Epoch 60/200
6/6 - 2s - loss: 0.1458 - val_loss: 0.1299
Epoch 61/200
6/6 - 2s - loss: 0.1362 - val_loss: 0.1725
Epoch 62/200
6/6 - 2s - loss: 0.1392 - val_loss: 0.1329
Epoch 63/200
6/6 - 2s - loss: 0.1503 - val_loss: 0.2218
Epoch 64/200
6/6 - 2s - loss: 0.1678 - val_loss: 0.1273
Epoch 65/200
6/6 - 2s - loss: 0.1307 - val_loss: 0.1408
Epoch 66/200
6/6 - 2s - loss: 0.1373 - val_loss: 0.1428
Epoch 67/200
6/6 - 2s - loss: 0.1342 - val_loss: 0.1255
Epoch 68/200
6/6 - 2s - loss: 0.1306 - val_loss: 0.1221
Epoch 69/200
6/6 - 2s - loss: 0.1319 - val_loss: 0.1557
Epoch 70/200
6/6 - 2s - loss: 0.1293 - val_loss: 0.1226
Epoch 71/200
6/6 - 2s - loss: 0.1356 - val_loss: 0.1306
Epoch 72/200
6/6 - 2s - loss: 0.1256 - val_loss: 0.1284
Epoch 73/200
6/6 - 2s - loss: 0.1347 - val_loss: 0.1365
Epoch 74/200
6/6 - 2s - loss: 0.1302 - val_loss: 0.1297
Epoch 75/200
6/6 - 2s - loss: 0.1257 - val_loss: 0.1162
Epoch 76/200
6/6 - 2s - loss: 0.1328 - val_loss: 0.1178
Epoch 77/200
6/6 - 2s - loss: 0.1299 - val_loss: 0.1339
Epoch 78/200
6/6 - 2s - loss: 0.1227 - val_loss: 0.1199
Epoch 79/200
6/6 - 2s - loss: 0.1293 - val_loss: 0.1194
Epoch 80/200
6/6 - 2s - loss: 0.1279 - val_loss: 0.1281
Epoch 81/200
6/6 - 2s - loss: 0.1164 - val_loss: 0.1354
Epoch 82/200
6/6 - 2s - loss: 0.1175 - val_loss: 0.1519
Epoch 83/200
6/6 - 2s - loss: 0.1236 - val_loss: 0.1153
Epoch 84/200
6/6 - 2s - loss: 0.1323 - val_loss: 0.1478
Epoch 85/200
6/6 - 2s - loss: 0.1273 - val_loss: 0.1294
Epoch 86/200
6/6 - 2s - loss: 0.1291 - val_loss: 0.1298
Epoch 87/200
6/6 - 2s - loss: 0.1258 - val_loss: 0.1110
Epoch 88/200
6/6 - 2s - loss: 0.1220 - val_loss: 0.1140
Epoch 89/200
6/6 - 2s - loss: 0.1113 - val_loss: 0.1314
Epoch 90/200
6/6 - 2s - loss: 0.1177 - val_loss: 0.1095
Epoch 91/200
6/6 - 2s - loss: 0.1240 - val_loss: 0.1307
Epoch 92/200
6/6 - 2s - loss: 0.1070 - val_loss: 0.1200
Epoch 93/200
6/6 - 2s - loss: 0.1158 - val_loss: 0.1079
Epoch 94/200
6/6 - 2s - loss: 0.1167 - val_loss: 0.1295
Epoch 95/200
6/6 - 2s - loss: 0.1090 - val_loss: 0.1188
Epoch 96/200
6/6 - 2s - loss: 0.1120 - val_loss: 0.1091
Epoch 97/200
6/6 - 2s - loss: 0.1109 - val_loss: 0.1290
Epoch 98/200
6/6 - 2s - loss: 0.1133 - val_loss: 0.1112
Epoch 99/200
6/6 - 2s - loss: 0.1204 - val_loss: 0.1223
Epoch 100/200
6/6 - 2s - loss: 0.1106 - val_loss: 0.1265
Epoch 101/200
6/6 - 2s - loss: 0.1153 - val_loss: 0.1107
Epoch 102/200
6/6 - 2s - loss: 0.1137 - val_loss: 0.1268
Epoch 103/200
6/6 - 2s - loss: 0.1111 - val_loss: 0.1213
Epoch 104/200
6/6 - 2s - loss: 0.1094 - val_loss: 0.0997
Epoch 105/200
6/6 - 2s - loss: 0.1193 - val_loss: 0.1294
Epoch 106/200
6/6 - 2s - loss: 0.1048 - val_loss: 0.1244
Epoch 107/200
6/6 - 2s - loss: 0.1049 - val_loss: 0.1192
Epoch 108/200
6/6 - 2s - loss: 0.1101 - val_loss: 0.1121
Epoch 109/200
6/6 - 2s - loss: 0.1094 - val_loss: 0.1033
Epoch 110/200
6/6 - 2s - loss: 0.1073 - val_loss: 0.1333
Epoch 111/200
6/6 - 2s - loss: 0.1030 - val_loss: 0.1138
Epoch 112/200
6/6 - 2s - loss: 0.1097 - val_loss: 0.1077
Epoch 113/200
6/6 - 2s - loss: 0.1059 - val_loss: 0.1097
Epoch 114/200
6/6 - 2s - loss: 0.1022 - val_loss: 0.1073
Epoch 115/200
6/6 - 2s - loss: 0.1058 - val_loss: 0.1277
Epoch 116/200
6/6 - 2s - loss: 0.1042 - val_loss: 0.1136
Epoch 117/200
6/6 - 2s - loss: 0.1022 - val_loss: 0.1078
Epoch 118/200
6/6 - 2s - loss: 0.1013 - val_loss: 0.1020
Epoch 119/200
6/6 - 2s - loss: 0.1133 - val_loss: 0.1051
Epoch 120/200
6/6 - 2s - loss: 0.1042 - val_loss: 0.1378
Epoch 121/200
6/6 - 2s - loss: 0.1093 - val_loss: 0.1031
Epoch 122/200
6/6 - 2s - loss: 0.1095 - val_loss: 0.1373
Epoch 123/200
6/6 - 2s - loss: 0.1023 - val_loss: 0.1219
Epoch 124/200
6/6 - 2s - loss: 0.1017 - val_loss: 0.0946
Epoch 125/200
6/6 - 2s - loss: 0.1105 - val_loss: 0.1125
Epoch 126/200
6/6 - 2s - loss: 0.1013 - val_loss: 0.1253
Epoch 127/200
6/6 - 2s - loss: 0.1000 - val_loss: 0.1787
Epoch 128/200
6/6 - 2s - loss: 0.1186 - val_loss: 0.0970
Epoch 129/200
6/6 - 2s - loss: 0.1153 - val_loss: 0.1497
Epoch 130/200
6/6 - 2s - loss: 0.1111 - val_loss: 0.1277
Epoch 131/200
6/6 - 2s - loss: 0.1103 - val_loss: 0.1296
Epoch 132/200
6/6 - 2s - loss: 0.1080 - val_loss: 0.1064
Epoch 133/200
6/6 - 2s - loss: 0.1076 - val_loss: 0.1319
Epoch 134/200
6/6 - 2s - loss: 0.1024 - val_loss: 0.1042
Epoch 135/200
6/6 - 2s - loss: 0.1006 - val_loss: 0.1541
Epoch 136/200
6/6 - 2s - loss: 0.1057 - val_loss: 0.1274
Epoch 137/200
6/6 - 2s - loss: 0.1081 - val_loss: 0.1367
Epoch 138/200
6/6 - 2s - loss: 0.1052 - val_loss: 0.1006
Epoch 139/200
6/6 - 2s - loss: 0.1126 - val_loss: 0.1608
Epoch 140/200
6/6 - 2s - loss: 0.1044 - val_loss: 0.1058
Epoch 141/200
6/6 - 2s - loss: 0.1046 - val_loss: 0.1355
Epoch 142/200
6/6 - 2s - loss: 0.1038 - val_loss: 0.1431
Epoch 143/200
6/6 - 2s - loss: 0.1089 - val_loss: 0.1004
Epoch 144/200
6/6 - 2s - loss: 0.1136 - val_loss: 0.2149
Epoch 145/200
6/6 - 2s - loss: 0.1313 - val_loss: 0.1283
Epoch 146/200
6/6 - 2s - loss: 0.0999 - val_loss: 0.1397
Epoch 147/200
6/6 - 2s - loss: 0.1149 - val_loss: 0.1352
Epoch 148/200
6/6 - 2s - loss: 0.1131 - val_loss: 0.1305
Epoch 149/200
6/6 - 2s - loss: 0.1067 - val_loss: 0.1293
Epoch 150/200
6/6 - 2s - loss: 0.0968 - val_loss: 0.1331
Epoch 151/200
6/6 - 2s - loss: 0.0973 - val_loss: 0.1221
Epoch 152/200
6/6 - 2s - loss: 0.1032 - val_loss: 0.1364
Epoch 153/200
6/6 - 2s - loss: 0.1081 - val_loss: 0.1183
Epoch 154/200
6/6 - 2s - loss: 0.1056 - val_loss: 0.1352
Epoch 155/200
6/6 - 2s - loss: 0.1125 - val_loss: 0.1544
Epoch 156/200
6/6 - 2s - loss: 0.1111 - val_loss: 0.1381
Epoch 157/200
6/6 - 2s - loss: 0.1162 - val_loss: 0.1669
Epoch 158/200
6/6 - 2s - loss: 0.1248 - val_loss: 0.1815
Epoch 159/200
6/6 - 2s - loss: 0.1143 - val_loss: 0.1225
Epoch 160/200
6/6 - 2s - loss: 0.1098 - val_loss: 0.1605
Epoch 161/200
6/6 - 2s - loss: 0.1232 - val_loss: 0.1878
Epoch 162/200
6/6 - 2s - loss: 0.1263 - val_loss: 0.1553
Epoch 163/200
6/6 - 2s - loss: 0.1035 - val_loss: 0.1301
Epoch 164/200
6/6 - 2s - loss: 0.1166 - val_loss: 0.1637
Epoch 165/200
6/6 - 2s - loss: 0.1369 - val_loss: 0.1681
Epoch 166/200
6/6 - 2s - loss: 0.1680 - val_loss: 0.1343
Epoch 167/200
6/6 - 2s - loss: 0.2081 - val_loss: 0.2258
Epoch 168/200
6/6 - 2s - loss: 0.1953 - val_loss: 0.2075
Epoch 169/200
6/6 - 2s - loss: 0.1743 - val_loss: 0.1986
Epoch 170/200
6/6 - 2s - loss: 0.1609 - val_loss: 0.1560
Epoch 171/200
6/6 - 2s - loss: 0.1435 - val_loss: 0.1631
Epoch 172/200
6/6 - 2s - loss: 0.1428 - val_loss: 0.1500
Epoch 173/200
6/6 - 2s - loss: 0.1366 - val_loss: 0.1447
Epoch 174/200
6/6 - 2s - loss: 0.1304 - val_loss: 0.1440
Epoch 175/200
6/6 - 2s - loss: 0.1349 - val_loss: 0.1669
Epoch 176/200
6/6 - 2s - loss: 0.1433 - val_loss: 0.1684
Epoch 177/200
6/6 - 2s - loss: 0.1418 - val_loss: 0.1772
Epoch 178/200
6/6 - 2s - loss: 0.1545 - val_loss: 0.1545
Epoch 179/200
6/6 - 2s - loss: 0.1541 - val_loss: 0.1220
Epoch 180/200
6/6 - 2s - loss: 0.1406 - val_loss: 0.1021
Epoch 181/200
6/6 - 2s - loss: 0.1148 - val_loss: 0.0990
Epoch 182/200
6/6 - 2s - loss: 0.1039 - val_loss: 0.1000
Epoch 183/200
6/6 - 2s - loss: 0.1033 - val_loss: 0.1137
Epoch 184/200
6/6 - 2s - loss: 0.1132 - val_loss: 0.1187
Epoch 185/200
6/6 - 2s - loss: 0.1276 - val_loss: 0.1065
Epoch 186/200
6/6 - 2s - loss: 0.1442 - val_loss: 0.1192
Epoch 187/200
6/6 - 2s - loss: 0.1462 - val_loss: 0.1659
Epoch 188/200
6/6 - 2s - loss: 0.1488 - val_loss: 0.1669
Epoch 189/200
6/6 - 2s - loss: 0.1537 - val_loss: 0.1458
Epoch 190/200
6/6 - 2s - loss: 0.1470 - val_loss: 0.1147
Epoch 191/200
6/6 - 2s - loss: 0.1347 - val_loss: 0.1122
Epoch 192/200
6/6 - 2s - loss: 0.1185 - val_loss: 0.0998
Epoch 193/200
6/6 - 2s - loss: 0.1021 - val_loss: 0.0940
Epoch 194/200
6/6 - 2s - loss: 0.1015 - val_loss: 0.1015
Epoch 195/200
6/6 - 2s - loss: 0.1106 - val_loss: 0.0967
Epoch 196/200
6/6 - 2s - loss: 0.1221 - val_loss: 0.0965
Epoch 197/200
6/6 - 2s - loss: 0.1308 - val_loss: 0.1395
Epoch 198/200
6/6 - 2s - loss: 0.1308 - val_loss: 0.1561
Epoch 199/200
6/6 - 2s - loss: 0.1406 - val_loss: 0.1415
Epoch 200/200
6/6 - 2s - loss: 0.1313 - val_loss: 0.1310
```

```
6it [3:26:36, 2497.33s/it]
```

```
Epoch 1/200
6/6 - 15s - loss: 0.9222 - val_loss: 0.6315
Epoch 2/200
6/6 - 2s - loss: 0.5985 - val_loss: 0.5460
Epoch 3/200
6/6 - 2s - loss: 0.5167 - val_loss: 0.5652
Epoch 4/200
6/6 - 2s - loss: 0.4949 - val_loss: 0.4768
Epoch 5/200
6/6 - 2s - loss: 0.4344 - val_loss: 0.4300
Epoch 6/200
6/6 - 2s - loss: 0.4076 - val_loss: 0.4373
Epoch 7/200
6/6 - 2s - loss: 0.4011 - val_loss: 0.3661
Epoch 8/200
6/6 - 2s - loss: 0.3691 - val_loss: 0.3462
Epoch 9/200
6/6 - 2s - loss: 0.3369 - val_loss: 0.3306
Epoch 10/200
6/6 - 2s - loss: 0.3257 - val_loss: 0.3207
Epoch 11/200
6/6 - 2s - loss: 0.3129 - val_loss: 0.3238
Epoch 12/200
6/6 - 2s - loss: 0.3003 - val_loss: 0.2988
Epoch 13/200
6/6 - 2s - loss: 0.2969 - val_loss: 0.3045
Epoch 14/200
6/6 - 2s - loss: 0.2925 - val_loss: 0.2770
Epoch 15/200
6/6 - 2s - loss: 0.2728 - val_loss: 0.2796
Epoch 16/200
6/6 - 2s - loss: 0.2593 - val_loss: 0.2643
Epoch 17/200
6/6 - 2s - loss: 0.2630 - val_loss: 0.2885
Epoch 18/200
6/6 - 2s - loss: 0.2797 - val_loss: 0.3132
Epoch 19/200
6/6 - 2s - loss: 0.2580 - val_loss: 0.2450
Epoch 20/200
6/6 - 2s - loss: 0.2525 - val_loss: 0.2340
Epoch 21/200
6/6 - 2s - loss: 0.2264 - val_loss: 0.2330
Epoch 22/200
6/6 - 2s - loss: 0.2246 - val_loss: 0.2263
Epoch 23/200
6/6 - 2s - loss: 0.2229 - val_loss: 0.2137
Epoch 24/200
6/6 - 2s - loss: 0.2077 - val_loss: 0.2124

Epoch 25/200
6/6 - 2s - loss: 0.2163 - val_loss: 0.2105
Epoch 26/200
6/6 - 2s - loss: 0.2198 - val_loss: 0.2489
Epoch 27/200
```

```
6/6 - 2s - loss: 0.2353 - val_loss: 0.2609
Epoch 28/200
6/6 - 2s - loss: 0.2212 - val_loss: 0.2293
Epoch 29/200
6/6 - 2s - loss: 0.2238 - val_loss: 0.2203
Epoch 30/200
6/6 - 2s - loss: 0.2013 - val_loss: 0.2113
Epoch 31/200
6/6 - 2s - loss: 0.2167 - val_loss: 0.2021
Epoch 32/200
6/6 - 2s - loss: 0.1940 - val_loss: 0.1916
Epoch 33/200
6/6 - 2s - loss: 0.1955 - val_loss: 0.1907
Epoch 34/200
6/6 - 2s - loss: 0.1963 - val_loss: 0.2099
Epoch 35/200
6/6 - 2s - loss: 0.2053 - val_loss: 0.1777
Epoch 36/200
6/6 - 2s - loss: 0.1916 - val_loss: 0.1916
Epoch 37/200
6/6 - 2s - loss: 0.1941 - val_loss: 0.1864
Epoch 38/200
6/6 - 2s - loss: 0.1843 - val_loss: 0.1697
Epoch 39/200
6/6 - 2s - loss: 0.2013 - val_loss: 0.1809
Epoch 40/200
6/6 - 2s - loss: 0.1847 - val_loss: 0.1768
Epoch 41/200
6/6 - 2s - loss: 0.1751 - val_loss: 0.1777
Epoch 42/200
6/6 - 2s - loss: 0.1799 - val_loss: 0.1688
Epoch 43/200
6/6 - 2s - loss: 0.1784 - val_loss: 0.1834
Epoch 44/200
6/6 - 2s - loss: 0.1883 - val_loss: 0.1724
Epoch 45/200
6/6 - 2s - loss: 0.1715 - val_loss: 0.1617
Epoch 46/200
6/6 - 2s - loss: 0.1731 - val_loss: 0.1623
Epoch 47/200
6/6 - 2s - loss: 0.1704 - val_loss: 0.1629
Epoch 48/200
6/6 - 2s - loss: 0.1665 - val_loss: 0.1508
Epoch 49/200
6/6 - 2s - loss: 0.1587 - val_loss: 0.1472
Epoch 50/200
6/6 - 2s - loss: 0.1686 - val_loss: 0.1584
Epoch 51/200
6/6 - 2s - loss: 0.1702 - val_loss: 0.2092
Epoch 52/200
6/6 - 2s - loss: 0.1634 - val_loss: 0.1454
Epoch 53/200
6/6 - 2s - loss: 0.1523 - val_loss: 0.1424
Epoch 54/200
6/6 - 2s - loss: 0.1569 - val_loss: 0.1511
Epoch 55/200
6/6 - 2s - loss: 0.1594 - val_loss: 0.1803
Epoch 56/200
6/6 - 2s - loss: 0.1543 - val_loss: 0.1330
Epoch 57/200
6/6 - 2s - loss: 0.1567 - val_loss: 0.1568
Epoch 58/200
6/6 - 2s - loss: 0.1648 - val_loss: 0.2709
Epoch 59/200
6/6 - 2s - loss: 0.1991 - val_loss: 0.1462
Epoch 60/200
6/6 - 2s - loss: 0.1452 - val_loss: 0.1412
Epoch 61/200
6/6 - 2s - loss: 0.1560 - val_loss: 0.1601
Epoch 62/200
6/6 - 2s - loss: 0.1448 - val_loss: 0.1438
Epoch 63/200
6/6 - 2s - loss: 0.1414 - val_loss: 0.1515
Epoch 64/200
6/6 - 2s - loss: 0.1588 - val_loss: 0.2081
Epoch 65/200
6/6 - 2s - loss: 0.1707 - val_loss: 0.1412
Epoch 66/200
6/6 - 2s - loss: 0.1359 - val_loss: 0.1397
Epoch 67/200
6/6 - 2s - loss: 0.1513 - val_loss: 0.1353
Epoch 68/200
6/6 - 2s - loss: 0.1304 - val_loss: 0.1240
Epoch 69/200
6/6 - 2s - loss: 0.1314 - val_loss: 0.1238
Epoch 70/200
6/6 - 2s - loss: 0.1300 - val_loss: 0.1376
Epoch 71/200
6/6 - 2s - loss: 0.1322 - val_loss: 0.1338
Epoch 72/200
6/6 - 2s - loss: 0.1310 - val_loss: 0.1509
Epoch 73/200
6/6 - 2s - loss: 0.1318 - val_loss: 0.1200
Epoch 74/200
6/6 - 2s - loss: 0.1262 - val_loss: 0.1203
Epoch 75/200
6/6 - 2s - loss: 0.1275 - val_loss: 0.1283
Epoch 76/200
6/6 - 2s - loss: 0.1216 - val_loss: 0.1146
Epoch 77/200
6/6 - 2s - loss: 0.1319 - val_loss: 0.1233
Epoch 78/200
6/6 - 2s - loss: 0.1213 - val_loss: 0.1533
Epoch 79/200
6/6 - 2s - loss: 0.1266 - val_loss: 0.1110
Epoch 80/200
6/6 - 2s - loss: 0.1254 - val_loss: 0.1302
Epoch 81/200
6/6 - 2s - loss: 0.1178 - val_loss: 0.1257
Epoch 82/200
6/6 - 2s - loss: 0.1232 - val_loss: 0.1135
Epoch 83/200
6/6 - 2s - loss: 0.1184 - val_loss: 0.1147
Epoch 84/200
6/6 - 2s - loss: 0.1178 - val_loss: 0.1159
Epoch 85/200
6/6 - 2s - loss: 0.1177 - val_loss: 0.1214
Epoch 86/200
6/6 - 2s - loss: 0.1160 - val_loss: 0.1374
Epoch 87/200
6/6 - 2s - loss: 0.1171 - val_loss: 0.1172
Epoch 88/200
6/6 - 2s - loss: 0.1259 - val_loss: 0.1106
Epoch 89/200
6/6 - 2s - loss: 0.1231 - val_loss: 0.1503
Epoch 90/200
6/6 - 2s - loss: 0.1197 - val_loss: 0.1289
Epoch 91/200
6/6 - 2s - loss: 0.1301 - val_loss: 0.1155
Epoch 92/200
6/6 - 2s - loss: 0.1274 - val_loss: 0.1408
Epoch 93/200
6/6 - 2s - loss: 0.1192 - val_loss: 0.1159
Epoch 94/200
6/6 - 2s - loss: 0.1293 - val_loss: 0.1366
Epoch 95/200
6/6 - 2s - loss: 0.1249 - val_loss: 0.1253
Epoch 96/200
6/6 - 2s - loss: 0.1113 - val_loss: 0.1048
Epoch 97/200
6/6 - 2s - loss: 0.1174 - val_loss: 0.1407
Epoch 98/200
6/6 - 2s - loss: 0.1110 - val_loss: 0.1218
Epoch 99/200
6/6 - 2s - loss: 0.1168 - val_loss: 0.1007
Epoch 100/200
6/6 - 2s - loss: 0.1149 - val_loss: 0.1156
Epoch 101/200
6/6 - 2s - loss: 0.1053 - val_loss: 0.1028
Epoch 102/200
6/6 - 2s - loss: 0.1080 - val_loss: 0.1039
Epoch 103/200
6/6 - 2s - loss: 0.1043 - val_loss: 0.1241
Epoch 104/200
6/6 - 2s - loss: 0.1069 - val_loss: 0.1150
Epoch 105/200
6/6 - 2s - loss: 0.1088 - val_loss: 0.0983
Epoch 106/200
6/6 - 2s - loss: 0.1158 - val_loss: 0.1194
Epoch 107/200
6/6 - 2s - loss: 0.1040 - val_loss: 0.1328
Epoch 108/200
6/6 - 2s - loss: 0.1148 - val_loss: 0.0976
Epoch 109/200
6/6 - 2s - loss: 0.1221 - val_loss: 0.1393
Epoch 110/200
6/6 - 2s - loss: 0.1141 - val_loss: 0.1082
Epoch 111/200
6/6 - 2s - loss: 0.1156 - val_loss: 0.1417
Epoch 112/200
6/6 - 2s - loss: 0.1113 - val_loss: 0.1057
Epoch 113/200
6/6 - 2s - loss: 0.1086 - val_loss: 0.1168
Epoch 114/200
6/6 - 2s - loss: 0.1121 - val_loss: 0.1260
Epoch 115/200
6/6 - 2s - loss: 0.1118 - val_loss: 0.1307
Epoch 116/200
6/6 - 2s - loss: 0.1150 - val_loss: 0.1183
Epoch 117/200
6/6 - 2s - loss: 0.1226 - val_loss: 0.1023
Epoch 118/200
6/6 - 2s - loss: 0.1150 - val_loss: 0.1236
Epoch 119/200
6/6 - 2s - loss: 0.1070 - val_loss: 0.1169
Epoch 120/200
6/6 - 2s - loss: 0.1065 - val_loss: 0.1237
Epoch 121/200
6/6 - 2s - loss: 0.0995 - val_loss: 0.1009
Epoch 122/200
6/6 - 2s - loss: 0.1099 - val_loss: 0.0989
Epoch 123/200
6/6 - 2s - loss: 0.1077 - val_loss: 0.1223
Epoch 124/200
6/6 - 2s - loss: 0.1074 - val_loss: 0.1214
Epoch 125/200
6/6 - 2s - loss: 0.1051 - val_loss: 0.1121
Epoch 126/200
6/6 - 2s - loss: 0.1227 - val_loss: 0.1108
Epoch 127/200
6/6 - 2s - loss: 0.1029 - val_loss: 0.1050
Epoch 128/200
6/6 - 2s - loss: 0.1027 - val_loss: 0.1142
Epoch 129/200
6/6 - 2s - loss: 0.0974 - val_loss: 0.1191
Epoch 130/200
6/6 - 2s - loss: 0.0986 - val_loss: 0.1158
Epoch 131/200
6/6 - 2s - loss: 0.1063 - val_loss: 0.1015
Epoch 132/200
6/6 - 2s - loss: 0.0987 - val_loss: 0.1052
Epoch 133/200
6/6 - 2s - loss: 0.0986 - val_loss: 0.1004
Epoch 134/200
6/6 - 2s - loss: 0.0982 - val_loss: 0.0998
Epoch 135/200
6/6 - 2s - loss: 0.1035 - val_loss: 0.1053
Epoch 136/200
6/6 - 2s - loss: 0.0999 - val_loss: 0.1106
Epoch 137/200
6/6 - 2s - loss: 0.1005 - val_loss: 0.0967
Epoch 138/200
6/6 - 2s - loss: 0.0983 - val_loss: 0.1073
Epoch 139/200
6/6 - 2s - loss: 0.0956 - val_loss: 0.1379
Epoch 140/200
6/6 - 2s - loss: 0.1062 - val_loss: 0.1070
Epoch 141/200
6/6 - 2s - loss: 0.1113 - val_loss: 0.1096
Epoch 142/200
6/6 - 2s - loss: 0.0962 - val_loss: 0.1082
Epoch 143/200
6/6 - 2s - loss: 0.0987 - val_loss: 0.1091
Epoch 144/200
6/6 - 2s - loss: 0.0954 - val_loss: 0.1120
Epoch 145/200
6/6 - 2s - loss: 0.1023 - val_loss: 0.0953
Epoch 146/200
6/6 - 2s - loss: 0.1133 - val_loss: 0.1133
Epoch 147/200
6/6 - 2s - loss: 0.0988 - val_loss: 0.1437
Epoch 148/200
6/6 - 2s - loss: 0.1045 - val_loss: 0.0878
Epoch 149/200
6/6 - 2s - loss: 0.1180 - val_loss: 0.1777
Epoch 150/200
6/6 - 2s - loss: 0.1102 - val_loss: 0.1031
Epoch 151/200
6/6 - 2s - loss: 0.1074 - val_loss: 0.1630
Epoch 152/200
6/6 - 2s - loss: 0.1061 - val_loss: 0.0952
Epoch 153/200
6/6 - 2s - loss: 0.1005 - val_loss: 0.1476
Epoch 154/200
6/6 - 2s - loss: 0.1052 - val_loss: 0.1082
Epoch 155/200
6/6 - 2s - loss: 0.0959 - val_loss: 0.1109
Epoch 156/200
6/6 - 2s - loss: 0.1042 - val_loss: 0.1429
Epoch 157/200
6/6 - 2s - loss: 0.0990 - val_loss: 0.0928
Epoch 158/200
6/6 - 2s - loss: 0.0964 - val_loss: 0.1349
Epoch 159/200
6/6 - 2s - loss: 0.0918 - val_loss: 0.1200
Epoch 160/200
6/6 - 3s - loss: 0.0953 - val_loss: 0.1202
Epoch 161/200
6/6 - 3s - loss: 0.0962 - val_loss: 0.1219
Epoch 162/200
6/6 - 2s - loss: 0.0924 - val_loss: 0.0929
Epoch 163/200
6/6 - 2s - loss: 0.0975 - val_loss: 0.1177
Epoch 164/200
6/6 - 3s - loss: 0.0973 - val_loss: 0.1342
Epoch 165/200
6/6 - 2s - loss: 0.0977 - val_loss: 0.1127
Epoch 166/200
6/6 - 2s - loss: 0.1013 - val_loss: 0.1149
Epoch 167/200
6/6 - 3s - loss: 0.0933 - val_loss: 0.1224
Epoch 168/200
6/6 - 2s - loss: 0.0986 - val_loss: 0.1283
Epoch 169/200
6/6 - 2s - loss: 0.0910 - val_loss: 0.1514
Epoch 170/200
6/6 - 2s - loss: 0.1019 - val_loss: 0.1001
Epoch 171/200
6/6 - 2s - loss: 0.1050 - val_loss: 0.1798
Epoch 172/200
6/6 - 2s - loss: 0.1207 - val_loss: 0.1313
Epoch 173/200
6/6 - 2s - loss: 0.1088 - val_loss: 0.1051
Epoch 174/200
6/6 - 2s - loss: 0.1194 - val_loss: 0.1734
Epoch 175/200
6/6 - 2s - loss: 0.1257 - val_loss: 0.1755
Epoch 176/200
6/6 - 2s - loss: 0.1155 - val_loss: 0.1580
Epoch 177/200
6/6 - 2s - loss: 0.1182 - val_loss: 0.1935
Epoch 178/200
6/6 - 2s - loss: 0.1211 - val_loss: 0.1857
Epoch 179/200
6/6 - 2s - loss: 0.1292 - val_loss: 0.1520
Epoch 180/200
6/6 - 2s - loss: 0.1450 - val_loss: 0.1342
Epoch 181/200
6/6 - 2s - loss: 0.1894 - val_loss: 0.2198
Epoch 182/200
6/6 - 2s - loss: 0.2032 - val_loss: 0.2137
Epoch 183/200
6/6 - 2s - loss: 0.1736 - val_loss: 0.2030
Epoch 184/200
6/6 - 2s - loss: 0.1641 - val_loss: 0.1904
Epoch 185/200
6/6 - 2s - loss: 0.1536 - val_loss: 0.1553
Epoch 186/200
6/6 - 2s - loss: 0.1425 - val_loss: 0.1293
Epoch 187/200
6/6 - 2s - loss: 0.1219 - val_loss: 0.1071
Epoch 188/200
6/6 - 2s - loss: 0.1216 - val_loss: 0.0999
Epoch 189/200
6/6 - 3s - loss: 0.1319 - val_loss: 0.1049
Epoch 190/200
6/6 - 3s - loss: 0.1426 - val_loss: 0.1447
Epoch 191/200
6/6 - 3s - loss: 0.1478 - val_loss: 0.1965
Epoch 192/200
6/6 - 2s - loss: 0.1568 - val_loss: 0.1815
Epoch 193/200
6/6 - 3s - loss: 0.1594 - val_loss: 0.1465
Epoch 194/200
6/6 - 3s - loss: 0.1576 - val_loss: 0.1032
Epoch 195/200
6/6 - 3s - loss: 0.1096 - val_loss: 0.0963
Epoch 196/200
6/6 - 2s - loss: 0.1001 - val_loss: 0.0957
Epoch 197/200
6/6 - 2s - loss: 0.1033 - val_loss: 0.0864
Epoch 198/200
6/6 - 2s - loss: 0.1144 - val_loss: 0.1034
Epoch 199/200
6/6 - 2s - loss: 0.1299 - val_loss: 0.1194
Epoch 200/200
6/6 - 2s - loss: 0.1331 - val_loss: 0.1631
```

```
7it [3:33:42, 1875.94s/it]
```

```
Epoch 1/200
6/6 - 22s - loss: 0.8875 - val_loss: 0.6070
Epoch 2/200
6/6 - 2s - loss: 0.6008 - val_loss: 0.5555
Epoch 3/200
6/6 - 2s - loss: 0.5380 - val_loss: 0.4898
Epoch 4/200
6/6 - 2s - loss: 0.4691 - val_loss: 0.4312
Epoch 5/200
6/6 - 2s - loss: 0.4284 - val_loss: 0.4180
Epoch 6/200
6/6 - 2s - loss: 0.3857 - val_loss: 0.3822
Epoch 7/200
6/6 - 2s - loss: 0.3579 - val_loss: 0.3473
Epoch 8/200
6/6 - 2s - loss: 0.3270 - val_loss: 0.3278
Epoch 9/200
6/6 - 2s - loss: 0.3152 - val_loss: 0.3244
Epoch 10/200
6/6 - 2s - loss: 0.3146 - val_loss: 0.3070
Epoch 11/200
6/6 - 2s - loss: 0.2985 - val_loss: 0.2947
Epoch 12/200
6/6 - 2s - loss: 0.2787 - val_loss: 0.2756
Epoch 13/200
6/6 - 2s - loss: 0.2794 - val_loss: 0.2782
Epoch 14/200
6/6 - 2s - loss: 0.2719 - val_loss: 0.3124
Epoch 15/200
6/6 - 2s - loss: 0.2915 - val_loss: 0.2889
Epoch 16/200
6/6 - 2s - loss: 0.2735 - val_loss: 0.2582
Epoch 17/200
6/6 - 2s - loss: 0.2489 - val_loss: 0.2458
Epoch 18/200
6/6 - 2s - loss: 0.2372 - val_loss: 0.2521
Epoch 19/200
6/6 - 2s - loss: 0.2356 - val_loss: 0.2318
Epoch 20/200
6/6 - 2s - loss: 0.2271 - val_loss: 0.2414
Epoch 21/200
6/6 - 2s - loss: 0.2287 - val_loss: 0.2199
Epoch 22/200
6/6 - 2s - loss: 0.2119 - val_loss: 0.2151
Epoch 23/200
6/6 - 2s - loss: 0.2091 - val_loss: 0.2157
Epoch 24/200
6/6 - 2s - loss: 0.2107 - val_loss: 0.2092
Epoch 25/200
6/6 - 2s - loss: 0.2003 - val_loss: 0.2060
Epoch 26/200
6/6 - 2s - loss: 0.2009 - val_loss: 0.2039
Epoch 27/200
6/6 - 2s - loss: 0.1960 - val_loss: 0.1987
Epoch 28/200
6/6 - 2s - loss: 0.1944 - val_loss: 0.1923
Epoch 29/200
6/6 - 2s - loss: 0.1930 - val_loss: 0.1831
Epoch 30/200
6/6 - 2s - loss: 0.1872 - val_loss: 0.1819
Epoch 31/200
6/6 - 2s - loss: 0.1870 - val_loss: 0.1792
Epoch 32/200
6/6 - 2s - loss: 0.1915 - val_loss: 0.1829
Epoch 33/200
6/6 - 2s - loss: 0.1833 - val_loss: 0.1749
Epoch 34/200
6/6 - 2s - loss: 0.1921 - val_loss: 0.1994
Epoch 35/200
6/6 - 2s - loss: 0.1949 - val_loss: 0.1716
Epoch 36/200
6/6 - 2s - loss: 0.1722 - val_loss: 0.1628
Epoch 37/200
6/6 - 2s - loss: 0.1755 - val_loss: 0.1584
Epoch 38/200
6/6 - 2s - loss: 0.1764 - val_loss: 0.1635
Epoch 39/200
6/6 - 2s - loss: 0.1689 - val_loss: 0.1647
Epoch 40/200
6/6 - 2s - loss: 0.1648 - val_loss: 0.1657
Epoch 41/200
6/6 - 2s - loss: 0.1759 - val_loss: 0.1801
Epoch 42/200
6/6 - 2s - loss: 0.1879 - val_loss: 0.1846
Epoch 43/200
6/6 - 2s - loss: 0.1800 - val_loss: 0.1636
Epoch 44/200
6/6 - 2s - loss: 0.1725 - val_loss: 0.1563
Epoch 45/200
6/6 - 2s - loss: 0.1680 - val_loss: 0.1430
Epoch 46/200
6/6 - 2s - loss: 0.1526 - val_loss: 0.1644
Epoch 47/200
6/6 - 2s - loss: 0.1571 - val_loss: 0.1358
Epoch 48/200
6/6 - 2s - loss: 0.1515 - val_loss: 0.1441
Epoch 49/200
6/6 - 2s - loss: 0.1579 - val_loss: 0.1317
Epoch 50/200
6/6 - 2s - loss: 0.1440 - val_loss: 0.1449
Epoch 51/200
6/6 - 2s - loss: 0.1519 - val_loss: 0.1374
Epoch 52/200
6/6 - 2s - loss: 0.1538 - val_loss: 0.1674
Epoch 53/200
6/6 - 2s - loss: 0.1636 - val_loss: 0.1689
Epoch 54/200
6/6 - 2s - loss: 0.1658 - val_loss: 0.1443
Epoch 55/200
6/6 - 2s - loss: 0.1497 - val_loss: 0.1459
Epoch 56/200
6/6 - 2s - loss: 0.1482 - val_loss: 0.1459
Epoch 57/200
6/6 - 2s - loss: 0.1515 - val_loss: 0.1612
Epoch 58/200
6/6 - 2s - loss: 0.1579 - val_loss: 0.1442
Epoch 59/200
6/6 - 2s - loss: 0.1474 - val_loss: 0.1811
Epoch 60/200
6/6 - 2s - loss: 0.1521 - val_loss: 0.1296
Epoch 61/200
6/6 - 2s - loss: 0.1363 - val_loss: 0.1666
Epoch 62/200
6/6 - 2s - loss: 0.1546 - val_loss: 0.1369
Epoch 63/200
6/6 - 2s - loss: 0.1459 - val_loss: 0.1813
Epoch 64/200
6/6 - 2s - loss: 0.1672 - val_loss: 0.1444
Epoch 65/200
6/6 - 3s - loss: 0.1344 - val_loss: 0.1385
Epoch 66/200
6/6 - 2s - loss: 0.1383 - val_loss: 0.1402
Epoch 67/200
6/6 - 2s - loss: 0.1372 - val_loss: 0.1283
Epoch 68/200
6/6 - 2s - loss: 0.1359 - val_loss: 0.1197
Epoch 69/200
6/6 - 2s - loss: 0.1312 - val_loss: 0.1165
Epoch 70/200
6/6 - 2s - loss: 0.1227 - val_loss: 0.1129
Epoch 71/200
6/6 - 2s - loss: 0.1257 - val_loss: 0.1104
Epoch 72/200
6/6 - 2s - loss: 0.1215 - val_loss: 0.1125
Epoch 73/200
6/6 - 2s - loss: 0.1197 - val_loss: 0.1276
Epoch 74/200
6/6 - 2s - loss: 0.1187 - val_loss: 0.1131
Epoch 75/200
6/6 - 2s - loss: 0.1264 - val_loss: 0.1137
Epoch 76/200
6/6 - 2s - loss: 0.1158 - val_loss: 0.1153
Epoch 77/200
6/6 - 2s - loss: 0.1111 - val_loss: 0.1338
Epoch 78/200
6/6 - 2s - loss: 0.1290 - val_loss: 0.1178
Epoch 79/200
6/6 - 2s - loss: 0.1351 - val_loss: 0.1627
Epoch 80/200
6/6 - 2s - loss: 0.1338 - val_loss: 0.1247
Epoch 81/200
6/6 - 2s - loss: 0.1313 - val_loss: 0.1716
Epoch 82/200
6/6 - 2s - loss: 0.1434 - val_loss: 0.1108
Epoch 83/200
6/6 - 2s - loss: 0.1229 - val_loss: 0.1528
Epoch 84/200
6/6 - 2s - loss: 0.1227 - val_loss: 0.1131
Epoch 85/200
6/6 - 2s - loss: 0.1183 - val_loss: 0.1588
Epoch 86/200
6/6 - 2s - loss: 0.1270 - val_loss: 0.1085
Epoch 87/200
6/6 - 2s - loss: 0.1190 - val_loss: 0.1397
Epoch 88/200
6/6 - 2s - loss: 0.1203 - val_loss: 0.1111
Epoch 89/200
6/6 - 2s - loss: 0.1190 - val_loss: 0.1473
Epoch 90/200
6/6 - 2s - loss: 0.1247 - val_loss: 0.1300
Epoch 91/200
6/6 - 2s - loss: 0.1224 - val_loss: 0.1194
Epoch 92/200
6/6 - 2s - loss: 0.1151 - val_loss: 0.1133
Epoch 93/200
6/6 - 2s - loss: 0.1147 - val_loss: 0.1528
Epoch 94/200
6/6 - 2s - loss: 0.1179 - val_loss: 0.1183
Epoch 95/200
6/6 - 2s - loss: 0.1164 - val_loss: 0.1260
Epoch 96/200
6/6 - 2s - loss: 0.1343 - val_loss: 0.1539
Epoch 97/200
6/6 - 2s - loss: 0.1233 - val_loss: 0.1113
Epoch 98/200
6/6 - 2s - loss: 0.1166 - val_loss: 0.1130
Epoch 99/200
6/6 - 2s - loss: 0.1190 - val_loss: 0.1126
Epoch 100/200
6/6 - 2s - loss: 0.1074 - val_loss: 0.1232
Epoch 101/200
6/6 - 2s - loss: 0.1137 - val_loss: 0.1037
Epoch 102/200
6/6 - 2s - loss: 0.1211 - val_loss: 0.1511
Epoch 103/200
6/6 - 2s - loss: 0.1153 - val_loss: 0.1074
Epoch 104/200
6/6 - 2s - loss: 0.1165 - val_loss: 0.1189
Epoch 105/200
6/6 - 2s - loss: 0.1088 - val_loss: 0.1198
Epoch 106/200
6/6 - 2s - loss: 0.1095 - val_loss: 0.1058
Epoch 107/200
6/6 - 2s - loss: 0.1122 - val_loss: 0.1100
Epoch 108/200
6/6 - 2s - loss: 0.1079 - val_loss: 0.0999
Epoch 109/200
6/6 - 2s - loss: 0.1146 - val_loss: 0.1111
Epoch 110/200
6/6 - 2s - loss: 0.1081 - val_loss: 0.1073
Epoch 111/200
6/6 - 2s - loss: 0.1051 - val_loss: 0.1172
Epoch 112/200
6/6 - 2s - loss: 0.1081 - val_loss: 0.1195
Epoch 113/200
6/6 - 2s - loss: 0.1067 - val_loss: 0.1054
Epoch 114/200
6/6 - 2s - loss: 0.1035 - val_loss: 0.1101
Epoch 115/200
6/6 - 2s - loss: 0.1033 - val_loss: 0.1319
Epoch 116/200
6/6 - 2s - loss: 0.1074 - val_loss: 0.1164
Epoch 117/200
6/6 - 2s - loss: 0.1096 - val_loss: 0.1305
Epoch 118/200
6/6 - 2s - loss: 0.1112 - val_loss: 0.1266
Epoch 119/200
6/6 - 2s - loss: 0.1119 - val_loss: 0.1322
Epoch 120/200
6/6 - 2s - loss: 0.1175 - val_loss: 0.1061
Epoch 121/200
6/6 - 2s - loss: 0.1148 - val_loss: 0.1087
Epoch 122/200
6/6 - 2s - loss: 0.1085 - val_loss: 0.1119
Epoch 123/200
6/6 - 2s - loss: 0.1141 - val_loss: 0.1138
Epoch 124/200
6/6 - 2s - loss: 0.1064 - val_loss: 0.1087
Epoch 125/200
6/6 - 2s - loss: 0.1094 - val_loss: 0.1090
Epoch 126/200
6/6 - 2s - loss: 0.0988 - val_loss: 0.1293
Epoch 127/200
6/6 - 2s - loss: 0.1042 - val_loss: 0.1014
Epoch 128/200
6/6 - 2s - loss: 0.1099 - val_loss: 0.1219
Epoch 129/200
6/6 - 2s - loss: 0.1051 - val_loss: 0.1071
Epoch 130/200
6/6 - 2s - loss: 0.1087 - val_loss: 0.1101
Epoch 131/200
6/6 - 2s - loss: 0.1079 - val_loss: 0.1185
Epoch 132/200
6/6 - 2s - loss: 0.1027 - val_loss: 0.1117
Epoch 133/200
6/6 - 2s - loss: 0.1039 - val_loss: 0.1211
Epoch 134/200
6/6 - 2s - loss: 0.1009 - val_loss: 0.1322
Epoch 135/200
6/6 - 2s - loss: 0.1047 - val_loss: 0.1109
Epoch 136/200
6/6 - 2s - loss: 0.1009 - val_loss: 0.1270
Epoch 137/200
6/6 - 2s - loss: 0.1088 - val_loss: 0.0936
Epoch 138/200
6/6 - 2s - loss: 0.1000 - val_loss: 0.1129
Epoch 139/200
6/6 - 2s - loss: 0.1008 - val_loss: 0.1114
Epoch 140/200
6/6 - 2s - loss: 0.1054 - val_loss: 0.1229
Epoch 141/200
6/6 - 2s - loss: 0.1033 - val_loss: 0.1279
Epoch 142/200
6/6 - 2s - loss: 0.1026 - val_loss: 0.0999
Epoch 143/200
6/6 - 2s - loss: 0.1001 - val_loss: 0.1045
Epoch 144/200
6/6 - 2s - loss: 0.0995 - val_loss: 0.1082
Epoch 145/200
6/6 - 2s - loss: 0.0984 - val_loss: 0.1236
Epoch 146/200
6/6 - 2s - loss: 0.1002 - val_loss: 0.1253
Epoch 147/200
6/6 - 2s - loss: 0.1089 - val_loss: 0.1004
Epoch 148/200
6/6 - 2s - loss: 0.1036 - val_loss: 0.1165
Epoch 149/200
6/6 - 2s - loss: 0.1009 - val_loss: 0.1203
Epoch 150/200
6/6 - 2s - loss: 0.1029 - val_loss: 0.1188
Epoch 151/200
6/6 - 2s - loss: 0.0991 - val_loss: 0.1182
Epoch 152/200
6/6 - 2s - loss: 0.0982 - val_loss: 0.0877
Epoch 153/200
6/6 - 2s - loss: 0.1128 - val_loss: 0.1779
Epoch 154/200
6/6 - 2s - loss: 0.1131 - val_loss: 0.1011
Epoch 155/200
6/6 - 2s - loss: 0.0939 - val_loss: 0.1236
Epoch 156/200
6/6 - 2s - loss: 0.0968 - val_loss: 0.0998
Epoch 157/200
6/6 - 2s - loss: 0.1008 - val_loss: 0.1434
Epoch 158/200
6/6 - 2s - loss: 0.0959 - val_loss: 0.1107
Epoch 159/200
6/6 - 2s - loss: 0.0988 - val_loss: 0.1160
Epoch 160/200
6/6 - 3s - loss: 0.1003 - val_loss: 0.1156
Epoch 161/200
6/6 - 263990s - loss: 0.0919 - val_loss: 0.1153
Epoch 162/200
6/6 - 3s - loss: 0.0967 - val_loss: 0.1388
Epoch 163/200
6/6 - 4s - loss: 0.0981 - val_loss: 0.1004
Epoch 164/200
6/6 - 3s - loss: 0.1060 - val_loss: 0.1452
Epoch 165/200
6/6 - 4s - loss: 0.1030 - val_loss: 0.1074
Epoch 166/200
6/6 - 4s - loss: 0.0954 - val_loss: 0.1185
Epoch 167/200
6/6 - 4s - loss: 0.0990 - val_loss: 0.1042
Epoch 168/200
6/6 - 3s - loss: 0.0992 - val_loss: 0.1489
Epoch 169/200
6/6 - 3s - loss: 0.0963 - val_loss: 0.0990
Epoch 170/200
6/6 - 3s - loss: 0.1007 - val_loss: 0.1592
Epoch 171/200
6/6 - 2s - loss: 0.1031 - val_loss: 0.1015
Epoch 172/200
6/6 - 3s - loss: 0.1031 - val_loss: 0.1254
Epoch 173/200
6/6 - 3s - loss: 0.0937 - val_loss: 0.0994
Epoch 174/200
6/6 - 2s - loss: 0.0888 - val_loss: 0.1088
Epoch 175/200
6/6 - 3s - loss: 0.0915 - val_loss: 0.0990
Epoch 176/200
6/6 - 2s - loss: 0.0870 - val_loss: 0.1367
Epoch 177/200
6/6 - 2s - loss: 0.0937 - val_loss: 0.1043
Epoch 178/200
6/6 - 3s - loss: 0.0942 - val_loss: 0.1380
Epoch 179/200
6/6 - 3s - loss: 0.0996 - val_loss: 0.1245
Epoch 180/200
6/6 - 3s - loss: 0.0949 - val_loss: 0.1208
Epoch 181/200
6/6 - 4s - loss: 0.1146 - val_loss: 0.1721
Epoch 182/200
6/6 - 3s - loss: 0.1128 - val_loss: 0.1315
Epoch 183/200
6/6 - 4s - loss: 0.1076 - val_loss: 0.1441
Epoch 184/200
6/6 - 4s - loss: 0.1002 - val_loss: 0.1335
Epoch 185/200
6/6 - 4s - loss: 0.0993 - val_loss: 0.1254
Epoch 186/200
6/6 - 4s - loss: 0.0955 - val_loss: 0.1429
Epoch 187/200
6/6 - 3s - loss: 0.0988 - val_loss: 0.1288
Epoch 188/200
6/6 - 3s - loss: 0.0996 - val_loss: 0.1454
Epoch 189/200
6/6 - 3s - loss: 0.1140 - val_loss: 0.1948
Epoch 190/200
6/6 - 2s - loss: 0.1326 - val_loss: 0.2133
Epoch 191/200
6/6 - 3s - loss: 0.1543 - val_loss: 0.1510
Epoch 192/200
6/6 - 3s - loss: 0.1875 - val_loss: 0.1706
Epoch 193/200
6/6 - 3s - loss: 0.1962 - val_loss: 0.2458
Epoch 194/200
6/6 - 4s - loss: 0.2034 - val_loss: 0.1989
Epoch 195/200
6/6 - 4s - loss: 0.1700 - val_loss: 0.1764
Epoch 196/200
6/6 - 3s - loss: 0.1521 - val_loss: 0.1813
Epoch 197/200
6/6 - 3s - loss: 0.1509 - val_loss: 0.1414
Epoch 198/200
6/6 - 4s - loss: 0.1280 - val_loss: 0.1171
Epoch 199/200
6/6 - 3s - loss: 0.1192 - val_loss: 0.1098
Epoch 200/200
6/6 - 4s - loss: 0.1169 - val_loss: 0.0937
```

```
8it [77:01:35, 80654.85s/it]
```

```
Epoch 1/200
6/6 - 30s - loss: 0.8912 - val_loss: 0.6429
Epoch 2/200
6/6 - 2s - loss: 0.6035 - val_loss: 0.5594
Epoch 3/200
6/6 - 2s - loss: 0.5228 - val_loss: 0.5018
Epoch 4/200
6/6 - 2s - loss: 0.4682 - val_loss: 0.4298
Epoch 5/200
6/6 - 2s - loss: 0.4402 - val_loss: 0.4101
Epoch 6/200
6/6 - 2s - loss: 0.3904 - val_loss: 0.3739
Epoch 7/200
6/6 - 2s - loss: 0.3753 - val_loss: 0.3515
Epoch 8/200
6/6 - 2s - loss: 0.3428 - val_loss: 0.3286
Epoch 9/200
6/6 - 2s - loss: 0.3271 - val_loss: 0.3406
Epoch 10/200
6/6 - 3s - loss: 0.3419 - val_loss: 0.3381
Epoch 11/200
6/6 - 3s - loss: 0.3125 - val_loss: 0.2994
Epoch 12/200
6/6 - 3s - loss: 0.3064 - val_loss: 0.2927
Epoch 13/200
6/6 - 3s - loss: 0.2990 - val_loss: 0.2871
Epoch 14/200
6/6 - 2s - loss: 0.2776 - val_loss: 0.2747
Epoch 15/200
6/6 - 3s - loss: 0.2700 - val_loss: 0.2822
Epoch 16/200
6/6 - 2s - loss: 0.2822 - val_loss: 0.2660
Epoch 17/200
6/6 - 2s - loss: 0.2505 - val_loss: 0.2394
Epoch 18/200
6/6 - 2s - loss: 0.2541 - val_loss: 0.2704
Epoch 19/200
6/6 - 6s - loss: 0.2730 - val_loss: 0.2595
Epoch 20/200
6/6 - 2s - loss: 0.2371 - val_loss: 0.2286
Epoch 21/200
6/6 - 2s - loss: 0.2445 - val_loss: 0.2609
Epoch 22/200
6/6 - 2s - loss: 0.2517 - val_loss: 0.2482
Epoch 23/200
6/6 - 2s - loss: 0.2344 - val_loss: 0.2336
Epoch 24/200
6/6 - 2s - loss: 0.2292 - val_loss: 0.2114
Epoch 25/200
6/6 - 2s - loss: 0.2148 - val_loss: 0.2085
Epoch 26/200
6/6 - 2s - loss: 0.2110 - val_loss: 0.2074
Epoch 27/200
6/6 - 2s - loss: 0.2163 - val_loss: 0.2078
Epoch 28/200
6/6 - 2s - loss: 0.2163 - val_loss: 0.2085
Epoch 29/200
6/6 - 2s - loss: 0.2086 - val_loss: 0.1982
Epoch 30/200
6/6 - 2s - loss: 0.2114 - val_loss: 0.1971
Epoch 31/200
6/6 - 2s - loss: 0.2264 - val_loss: 0.2057
Epoch 32/200
6/6 - 2s - loss: 0.2071 - val_loss: 0.2121
Epoch 33/200
6/6 - 2s - loss: 0.2187 - val_loss: 0.2134
Epoch 34/200
6/6 - 2s - loss: 0.2139 - val_loss: 0.2128
Epoch 35/200
6/6 - 2s - loss: 0.2046 - val_loss: 0.1877
Epoch 36/200
6/6 - 2s - loss: 0.1908 - val_loss: 0.1789
Epoch 37/200
6/6 - 2s - loss: 0.1772 - val_loss: 0.1817
Epoch 38/200
6/6 - 2s - loss: 0.1862 - val_loss: 0.1630
Epoch 39/200
6/6 - 2s - loss: 0.1809 - val_loss: 0.1543
Epoch 40/200
6/6 - 2s - loss: 0.1723 - val_loss: 0.1553
Epoch 41/200
6/6 - 2s - loss: 0.1748 - val_loss: 0.1592
Epoch 42/200
6/6 - 2s - loss: 0.1708 - val_loss: 0.1528
Epoch 43/200
6/6 - 2s - loss: 0.1605 - val_loss: 0.1448
Epoch 44/200
6/6 - 2s - loss: 0.1637 - val_loss: 0.1544
Epoch 45/200
6/6 - 2s - loss: 0.1623 - val_loss: 0.1455
Epoch 46/200
6/6 - 2s - loss: 0.1515 - val_loss: 0.1469
Epoch 47/200
6/6 - 2s - loss: 0.1545 - val_loss: 0.1448
Epoch 48/200
```

```
6/6 - 2s - loss: 0.1722 - val_loss: 0.1888
Epoch 49/200
6/6 - 2s - loss: 0.1994 - val_loss: 0.2202
Epoch 50/200
6/6 - 2s - loss: 0.2077 - val_loss: 0.1694
Epoch 51/200
6/6 - 2s - loss: 0.1621 - val_loss: 0.1436
Epoch 52/200
6/6 - 2s - loss: 0.1662 - val_loss: 0.1442
Epoch 53/200
6/6 - 2s - loss: 0.1471 - val_loss: 0.1490
Epoch 54/200
6/6 - 2s - loss: 0.1571 - val_loss: 0.1314
Epoch 55/200
6/6 - 2s - loss: 0.1412 - val_loss: 0.1500
Epoch 56/200
6/6 - 2s - loss: 0.1506 - val_loss: 0.1334
Epoch 57/200
6/6 - 2s - loss: 0.1438 - val_loss: 0.1250
Epoch 58/200
6/6 - 2s - loss: 0.1357 - val_loss: 0.1248
Epoch 59/200
6/6 - 2s - loss: 0.1377 - val_loss: 0.1217
Epoch 60/200
6/6 - 2s - loss: 0.1333 - val_loss: 0.1403
Epoch 61/200
6/6 - 2s - loss: 0.1308 - val_loss: 0.1308
Epoch 62/200
6/6 - 2s - loss: 0.1398 - val_loss: 0.1342
Epoch 63/200
6/6 - 2s - loss: 0.1473 - val_loss: 0.1192
Epoch 64/200
6/6 - 2s - loss: 0.1335 - val_loss: 0.1185
Epoch 65/200
6/6 - 2s - loss: 0.1377 - val_loss: 0.1212
Epoch 66/200
6/6 - 2s - loss: 0.1343 - val_loss: 0.1175
Epoch 67/200
6/6 - 2s - loss: 0.1286 - val_loss: 0.1200
Epoch 68/200
6/6 - 2s - loss: 0.1308 - val_loss: 0.1309
Epoch 69/200
6/6 - 2s - loss: 0.1331 - val_loss: 0.1291
Epoch 70/200
6/6 - 3s - loss: 0.1300 - val_loss: 0.1246
Epoch 71/200
6/6 - 2s - loss: 0.1473 - val_loss: 0.1325
Epoch 72/200
6/6 - 2s - loss: 0.1414 - val_loss: 0.1464
Epoch 73/200
6/6 - 2s - loss: 0.1374 - val_loss: 0.1180
Epoch 74/200
6/6 - 2s - loss: 0.1371 - val_loss: 0.1214
Epoch 75/200
6/6 - 2s - loss: 0.1292 - val_loss: 0.1216
Epoch 76/200
6/6 - 2s - loss: 0.1362 - val_loss: 0.1201
Epoch 77/200
6/6 - 2s - loss: 0.1268 - val_loss: 0.1102
Epoch 78/200
6/6 - 2s - loss: 0.1218 - val_loss: 0.1069
Epoch 79/200
6/6 - 2s - loss: 0.1227 - val_loss: 0.1086
Epoch 80/200
6/6 - 2s - loss: 0.1262 - val_loss: 0.1194
Epoch 81/200
6/6 - 2s - loss: 0.1338 - val_loss: 0.1499
Epoch 82/200
6/6 - 2s - loss: 0.1261 - val_loss: 0.1075
Epoch 83/200
6/6 - 2s - loss: 0.1398 - val_loss: 0.1403
Epoch 84/200
6/6 - 2s - loss: 0.1279 - val_loss: 0.1135
Epoch 85/200
6/6 - 2s - loss: 0.1349 - val_loss: 0.1418
Epoch 86/200
6/6 - 2s - loss: 0.1355 - val_loss: 0.1304
Epoch 87/200
6/6 - 2s - loss: 0.1283 - val_loss: 0.1310
Epoch 88/200
6/6 - 2s - loss: 0.1348 - val_loss: 0.1488
Epoch 89/200
6/6 - 2s - loss: 0.1391 - val_loss: 0.1574
Epoch 90/200
6/6 - 2s - loss: 0.1439 - val_loss: 0.1329
Epoch 91/200
6/6 - 2s - loss: 0.1420 - val_loss: 0.1199
Epoch 92/200
6/6 - 2s - loss: 0.1255 - val_loss: 0.1039
Epoch 93/200
6/6 - 2s - loss: 0.1371 - val_loss: 0.1259
Epoch 94/200
6/6 - 2s - loss: 0.1169 - val_loss: 0.1083
Epoch 95/200
6/6 - 2s - loss: 0.1217 - val_loss: 0.1128
Epoch 96/200
6/6 - 2s - loss: 0.1152 - val_loss: 0.1111
Epoch 97/200
6/6 - 2s - loss: 0.1130 - val_loss: 0.0980
Epoch 98/200
6/6 - 2s - loss: 0.1150 - val_loss: 0.1000
Epoch 99/200
6/6 - 2s - loss: 0.1150 - val_loss: 0.1150
Epoch 100/200
6/6 - 2s - loss: 0.1106 - val_loss: 0.1343
Epoch 101/200
6/6 - 2s - loss: 0.1176 - val_loss: 0.1157
Epoch 102/200
6/6 - 2s - loss: 0.1263 - val_loss: 0.1240
Epoch 103/200
6/6 - 2s - loss: 0.1263 - val_loss: 0.1333
Epoch 104/200
6/6 - 2s - loss: 0.1195 - val_loss: 0.1178
Epoch 105/200
6/6 - 2s - loss: 0.1187 - val_loss: 0.1260
Epoch 106/200
6/6 - 2s - loss: 0.1128 - val_loss: 0.1262
Epoch 107/200
6/6 - 2s - loss: 0.1129 - val_loss: 0.0977
Epoch 108/200
6/6 - 2s - loss: 0.1206 - val_loss: 0.1014
Epoch 109/200
6/6 - 2s - loss: 0.1153 - val_loss: 0.0969
Epoch 110/200
6/6 - 2s - loss: 0.1080 - val_loss: 0.1296
Epoch 111/200
6/6 - 2s - loss: 0.1078 - val_loss: 0.1112
Epoch 112/200
6/6 - 2s - loss: 0.1104 - val_loss: 0.1022
Epoch 113/200
6/6 - 2s - loss: 0.1192 - val_loss: 0.1101
Epoch 114/200
6/6 - 2s - loss: 0.1040 - val_loss: 0.1031
Epoch 115/200
6/6 - 2s - loss: 0.1077 - val_loss: 0.1094
Epoch 116/200
6/6 - 2s - loss: 0.1129 - val_loss: 0.1061
Epoch 117/200
6/6 - 2s - loss: 0.1128 - val_loss: 0.1242
Epoch 118/200
6/6 - 2s - loss: 0.1048 - val_loss: 0.1114
Epoch 119/200
6/6 - 2s - loss: 0.1068 - val_loss: 0.1099
Epoch 120/200
6/6 - 2s - loss: 0.1201 - val_loss: 0.1019
Epoch 121/200
6/6 - 2s - loss: 0.1038 - val_loss: 0.1025
Epoch 122/200
6/6 - 2s - loss: 0.1079 - val_loss: 0.1096
Epoch 123/200
6/6 - 2s - loss: 0.1015 - val_loss: 0.1097
Epoch 124/200
6/6 - 2s - loss: 0.1070 - val_loss: 0.0960
Epoch 125/200
6/6 - 2s - loss: 0.1061 - val_loss: 0.1090
Epoch 126/200
6/6 - 2s - loss: 0.0969 - val_loss: 0.0962
Epoch 127/200
6/6 - 2s - loss: 0.0996 - val_loss: 0.1069
Epoch 128/200
6/6 - 2s - loss: 0.1033 - val_loss: 0.0946
Epoch 129/200
6/6 - 2s - loss: 0.1101 - val_loss: 0.1134
Epoch 130/200
6/6 - 2s - loss: 0.1011 - val_loss: 0.1205
Epoch 131/200
6/6 - 2s - loss: 0.1001 - val_loss: 0.0962
Epoch 132/200
6/6 - 2s - loss: 0.1056 - val_loss: 0.0943
Epoch 133/200
6/6 - 2s - loss: 0.0993 - val_loss: 0.0900
Epoch 134/200
6/6 - 2s - loss: 0.0991 - val_loss: 0.1165
Epoch 135/200
6/6 - 2s - loss: 0.1016 - val_loss: 0.1131
Epoch 136/200
6/6 - 2s - loss: 0.1040 - val_loss: 0.1076
Epoch 137/200
6/6 - 2s - loss: 0.1077 - val_loss: 0.1082
Epoch 138/200
6/6 - 2s - loss: 0.0969 - val_loss: 0.0984
Epoch 139/200
6/6 - 2s - loss: 0.0995 - val_loss: 0.1139
Epoch 140/200
6/6 - 2s - loss: 0.0998 - val_loss: 0.1162
Epoch 141/200
6/6 - 2s - loss: 0.1037 - val_loss: 0.1000
Epoch 142/200
6/6 - 2s - loss: 0.1024 - val_loss: 0.1277
Epoch 143/200
6/6 - 2s - loss: 0.1044 - val_loss: 0.1121
Epoch 144/200
6/6 - 2s - loss: 0.1044 - val_loss: 0.1245
Epoch 145/200
6/6 - 2s - loss: 0.0983 - val_loss: 0.0969
Epoch 146/200
6/6 - 2s - loss: 0.1113 - val_loss: 0.0990
Epoch 147/200
6/6 - 2s - loss: 0.1058 - val_loss: 0.1125
Epoch 148/200
6/6 - 2s - loss: 0.0994 - val_loss: 0.1181
Epoch 149/200
6/6 - 2s - loss: 0.1000 - val_loss: 0.1202
Epoch 150/200
6/6 - 2s - loss: 0.1020 - val_loss: 0.1045
Epoch 151/200
6/6 - 2s - loss: 0.1111 - val_loss: 0.1016
Epoch 152/200
6/6 - 2s - loss: 0.0989 - val_loss: 0.1173
Epoch 153/200
6/6 - 2s - loss: 0.0989 - val_loss: 0.1077
Epoch 154/200
6/6 - 2s - loss: 0.1018 - val_loss: 0.0952
Epoch 155/200
6/6 - 2s - loss: 0.1020 - val_loss: 0.0928
Epoch 156/200
6/6 - 2s - loss: 0.0983 - val_loss: 0.1340
Epoch 157/200
6/6 - 2s - loss: 0.1007 - val_loss: 0.1172
Epoch 158/200
6/6 - 2s - loss: 0.0978 - val_loss: 0.0929
Epoch 159/200
6/6 - 2s - loss: 0.1006 - val_loss: 0.1142
Epoch 160/200
6/6 - 2s - loss: 0.0973 - val_loss: 0.1215
Epoch 161/200
6/6 - 2s - loss: 0.0966 - val_loss: 0.1126
Epoch 162/200
6/6 - 2s - loss: 0.0977 - val_loss: 0.0942
Epoch 163/200
6/6 - 2s - loss: 0.1121 - val_loss: 0.1210
Epoch 164/200
6/6 - 2s - loss: 0.0937 - val_loss: 0.1340
Epoch 165/200
6/6 - 2s - loss: 0.0981 - val_loss: 0.1172
Epoch 166/200
6/6 - 2s - loss: 0.0946 - val_loss: 0.0927
Epoch 167/200
6/6 - 2s - loss: 0.1094 - val_loss: 0.1510
Epoch 168/200
6/6 - 2s - loss: 0.1014 - val_loss: 0.1062
Epoch 169/200
6/6 - 2s - loss: 0.1011 - val_loss: 0.1222
Epoch 170/200
6/6 - 2s - loss: 0.1053 - val_loss: 0.0988
Epoch 171/200
6/6 - 2s - loss: 0.0986 - val_loss: 0.1065
Epoch 172/200
6/6 - 2s - loss: 0.1002 - val_loss: 0.1279
Epoch 173/200
6/6 - 2s - loss: 0.0941 - val_loss: 0.0943
Epoch 174/200
6/6 - 2s - loss: 0.1010 - val_loss: 0.1178
Epoch 175/200
6/6 - 2s - loss: 0.0924 - val_loss: 0.1069
Epoch 176/200
6/6 - 2s - loss: 0.0969 - val_loss: 0.1035
Epoch 177/200
6/6 - 2s - loss: 0.0987 - val_loss: 0.0985
Epoch 178/200
6/6 - 2s - loss: 0.0958 - val_loss: 0.1600
Epoch 179/200
6/6 - 2s - loss: 0.1108 - val_loss: 0.0885
Epoch 180/200
6/6 - 2s - loss: 0.1061 - val_loss: 0.1633
Epoch 181/200
6/6 - 2s - loss: 0.1072 - val_loss: 0.0998
Epoch 182/200
6/6 - 2s - loss: 0.0987 - val_loss: 0.1469
Epoch 183/200
6/6 - 2s - loss: 0.1023 - val_loss: 0.0982
Epoch 184/200
6/6 - 2s - loss: 0.1052 - val_loss: 0.1331
Epoch 185/200
6/6 - 2s - loss: 0.0994 - val_loss: 0.1177
Epoch 186/200
6/6 - 2s - loss: 0.0965 - val_loss: 0.1096
Epoch 187/200
6/6 - 2s - loss: 0.0980 - val_loss: 0.1059
Epoch 188/200
6/6 - 2s - loss: 0.0960 - val_loss: 0.1128
Epoch 189/200
6/6 - 2s - loss: 0.1001 - val_loss: 0.1288
Epoch 190/200
6/6 - 2s - loss: 0.0980 - val_loss: 0.1146
Epoch 191/200
6/6 - 2s - loss: 0.0949 - val_loss: 0.1467
Epoch 192/200
6/6 - 2s - loss: 0.1066 - val_loss: 0.0995
Epoch 193/200
6/6 - 2s - loss: 0.0960 - val_loss: 0.1443
Epoch 194/200
6/6 - 2s - loss: 0.1072 - val_loss: 0.1364
Epoch 195/200
6/6 - 2s - loss: 0.1007 - val_loss: 0.1581
Epoch 196/200
6/6 - 2s - loss: 0.1152 - val_loss: 0.1570
Epoch 197/200
6/6 - 2s - loss: 0.1238 - val_loss: 0.1354
Epoch 198/200
6/6 - 2s - loss: 0.1118 - val_loss: 0.1392
Epoch 199/200
6/6 - 2s - loss: 0.1256 - val_loss: 0.1458
Epoch 200/200
6/6 - 2s - loss: 0.1282 - val_loss: 0.1582
```

```
9it [77:09:39, 56603.81s/it]
```

```
Epoch 1/200
6/6 - 20s - loss: 0.8783 - val_loss: 0.6595
Epoch 2/200
6/6 - 2s - loss: 0.5893 - val_loss: 0.5481
Epoch 3/200
6/6 - 2s - loss: 0.5035 - val_loss: 0.5095
Epoch 4/200
6/6 - 2s - loss: 0.4401 - val_loss: 0.4138
Epoch 5/200
6/6 - 2s - loss: 0.3975 - val_loss: 0.3910
Epoch 6/200
6/6 - 2s - loss: 0.3832 - val_loss: 0.4211
Epoch 7/200
6/6 - 3s - loss: 0.3815 - val_loss: 0.3552
Epoch 8/200
6/6 - 2s - loss: 0.3452 - val_loss: 0.3593
Epoch 9/200
6/6 - 2s - loss: 0.3354 - val_loss: 0.3163
Epoch 10/200
6/6 - 2s - loss: 0.3162 - val_loss: 0.3377
Epoch 11/200
6/6 - 2s - loss: 0.3176 - val_loss: 0.2977
Epoch 12/200
6/6 - 2s - loss: 0.2949 - val_loss: 0.3165
Epoch 13/200
6/6 - 2s - loss: 0.2987 - val_loss: 0.2778
Epoch 14/200
6/6 - 2s - loss: 0.2661 - val_loss: 0.2651
Epoch 15/200
6/6 - 2s - loss: 0.2636 - val_loss: 0.2608
Epoch 16/200
6/6 - 2s - loss: 0.2634 - val_loss: 0.2553
Epoch 17/200
6/6 - 2s - loss: 0.2503 - val_loss: 0.2602
Epoch 18/200
6/6 - 2s - loss: 0.2484 - val_loss: 0.2638
Epoch 19/200
6/6 - 2s - loss: 0.2453 - val_loss: 0.2411
Epoch 20/200
6/6 - 2s - loss: 0.2388 - val_loss: 0.2326
Epoch 21/200
6/6 - 2s - loss: 0.2401 - val_loss: 0.2421
Epoch 22/200
6/6 - 2s - loss: 0.2437 - val_loss: 0.2529
Epoch 23/200
6/6 - 2s - loss: 0.2404 - val_loss: 0.2350
Epoch 24/200
6/6 - 2s - loss: 0.2260 - val_loss: 0.2150
Epoch 25/200
6/6 - 2s - loss: 0.2209 - val_loss: 0.2154
Epoch 26/200
6/6 - 2s - loss: 0.2091 - val_loss: 0.2103
Epoch 27/200
6/6 - 2s - loss: 0.2104 - val_loss: 0.2002
Epoch 28/200
6/6 - 2s - loss: 0.2027 - val_loss: 0.2078
Epoch 29/200
6/6 - 2s - loss: 0.2000 - val_loss: 0.1936
Epoch 30/200
6/6 - 2s - loss: 0.2024 - val_loss: 0.1845
Epoch 31/200
6/6 - 2s - loss: 0.1923 - val_loss: 0.1819
Epoch 32/200
6/6 - 2s - loss: 0.1882 - val_loss: 0.1779
Epoch 33/200
6/6 - 2s - loss: 0.1902 - val_loss: 0.1796
Epoch 34/200
6/6 - 2s - loss: 0.1941 - val_loss: 0.2087
Epoch 35/200
6/6 - 2s - loss: 0.2051 - val_loss: 0.1961
Epoch 36/200
6/6 - 2s - loss: 0.1924 - val_loss: 0.1690
Epoch 37/200
6/6 - 2s - loss: 0.1933 - val_loss: 0.1729
Epoch 38/200
6/6 - 2s - loss: 0.1836 - val_loss: 0.1759
Epoch 39/200
6/6 - 2s - loss: 0.1804 - val_loss: 0.1628
Epoch 40/200
6/6 - 2s - loss: 0.1955 - val_loss: 0.1732
Epoch 41/200
6/6 - 2s - loss: 0.2010 - val_loss: 0.1784
Epoch 42/200
6/6 - 2s - loss: 0.1754 - val_loss: 0.1627
Epoch 43/200
6/6 - 2s - loss: 0.1703 - val_loss: 0.1595
Epoch 44/200
6/6 - 2s - loss: 0.1737 - val_loss: 0.1632
Epoch 45/200
6/6 - 2s - loss: 0.1737 - val_loss: 0.1589
Epoch 46/200
6/6 - 2s - loss: 0.1650 - val_loss: 0.1668
Epoch 47/200
6/6 - 2s - loss: 0.1668 - val_loss: 0.1553
Epoch 48/200
6/6 - 2s - loss: 0.1618 - val_loss: 0.1510
Epoch 49/200
6/6 - 2s - loss: 0.1651 - val_loss: 0.1564
Epoch 50/200
6/6 - 2s - loss: 0.1602 - val_loss: 0.1449
Epoch 51/200
6/6 - 2s - loss: 0.1654 - val_loss: 0.1387
Epoch 52/200
6/6 - 2s - loss: 0.1541 - val_loss: 0.1495
Epoch 53/200
6/6 - 2s - loss: 0.1497 - val_loss: 0.1482
Epoch 54/200
6/6 - 2s - loss: 0.1466 - val_loss: 0.1426
Epoch 55/200
6/6 - 2s - loss: 0.1604 - val_loss: 0.1493
Epoch 56/200
6/6 - 2s - loss: 0.1560 - val_loss: 0.1334
Epoch 57/200
6/6 - 2s - loss: 0.1503 - val_loss: 0.1542
Epoch 58/200
6/6 - 2s - loss: 0.1427 - val_loss: 0.1531
Epoch 59/200
6/6 - 2s - loss: 0.1517 - val_loss: 0.1515
Epoch 60/200
6/6 - 2s - loss: 0.1623 - val_loss: 0.1392
Epoch 61/200
6/6 - 2s - loss: 0.1373 - val_loss: 0.1262
Epoch 62/200
6/6 - 2s - loss: 0.1403 - val_loss: 0.1287
Epoch 63/200
6/6 - 2s - loss: 0.1404 - val_loss: 0.1353
Epoch 64/200
6/6 - 2s - loss: 0.1306 - val_loss: 0.1277
Epoch 65/200
6/6 - 2s - loss: 0.1359 - val_loss: 0.1255
Epoch 66/200
6/6 - 2s - loss: 0.1323 - val_loss: 0.1165
Epoch 67/200
6/6 - 2s - loss: 0.1351 - val_loss: 0.1321
Epoch 68/200
6/6 - 2s - loss: 0.1562 - val_loss: 0.2057
Epoch 69/200
6/6 - 2s - loss: 0.1471 - val_loss: 0.1229
Epoch 70/200
6/6 - 2s - loss: 0.1409 - val_loss: 0.1311
Epoch 71/200
6/6 - 2s - loss: 0.1337 - val_loss: 0.1157
Epoch 72/200
6/6 - 2s - loss: 0.1309 - val_loss: 0.1447
Epoch 73/200
6/6 - 2s - loss: 0.1269 - val_loss: 0.1330
Epoch 74/200
6/6 - 2s - loss: 0.1318 - val_loss: 0.1246
Epoch 75/200
6/6 - 2s - loss: 0.1429 - val_loss: 0.1385
Epoch 76/200
6/6 - 2s - loss: 0.1261 - val_loss: 0.1257
Epoch 77/200
6/6 - 2s - loss: 0.1283 - val_loss: 0.1269
Epoch 78/200
6/6 - 2s - loss: 0.1280 - val_loss: 0.1250
Epoch 79/200
6/6 - 2s - loss: 0.1242 - val_loss: 0.1232
Epoch 80/200
6/6 - 2s - loss: 0.1305 - val_loss: 0.1345
Epoch 81/200
6/6 - 2s - loss: 0.1336 - val_loss: 0.1444
Epoch 82/200
6/6 - 2s - loss: 0.1359 - val_loss: 0.1229
Epoch 83/200
6/6 - 2s - loss: 0.1400 - val_loss: 0.1426
Epoch 84/200
6/6 - 2s - loss: 0.1262 - val_loss: 0.1170
Epoch 85/200
6/6 - 2s - loss: 0.1228 - val_loss: 0.1143
Epoch 86/200
6/6 - 2s - loss: 0.1166 - val_loss: 0.1171
Epoch 87/200
6/6 - 2s - loss: 0.1149 - val_loss: 0.1065
Epoch 88/200
6/6 - 2s - loss: 0.1272 - val_loss: 0.1189
Epoch 89/200
6/6 - 2s - loss: 0.1204 - val_loss: 0.1122
Epoch 90/200
6/6 - 2s - loss: 0.1187 - val_loss: 0.1104
Epoch 91/200
6/6 - 2s - loss: 0.1311 - val_loss: 0.1267
Epoch 92/200
6/6 - 2s - loss: 0.1186 - val_loss: 0.1347
Epoch 93/200
6/6 - 2s - loss: 0.1271 - val_loss: 0.1132
Epoch 94/200
6/6 - 2s - loss: 0.1378 - val_loss: 0.1676
Epoch 95/200
6/6 - 2s - loss: 0.1207 - val_loss: 0.1167
Epoch 96/200
6/6 - 2s - loss: 0.1191 - val_loss: 0.1456
Epoch 97/200
6/6 - 2s - loss: 0.1176 - val_loss: 0.1104
Epoch 98/200
6/6 - 2s - loss: 0.1184 - val_loss: 0.1233
Epoch 99/200
6/6 - 2s - loss: 0.1095 - val_loss: 0.1081
Epoch 100/200
6/6 - 2s - loss: 0.1065 - val_loss: 0.1004
Epoch 101/200
6/6 - 2s - loss: 0.1110 - val_loss: 0.1034
Epoch 102/200
6/6 - 2s - loss: 0.1039 - val_loss: 0.1016
Epoch 103/200
6/6 - 2s - loss: 0.1045 - val_loss: 0.1078
Epoch 104/200
6/6 - 2s - loss: 0.1058 - val_loss: 0.1613
Epoch 105/200
6/6 - 2s - loss: 0.1232 - val_loss: 0.1143
Epoch 106/200
6/6 - 2s - loss: 0.1279 - val_loss: 0.1352
Epoch 107/200
6/6 - 2s - loss: 0.1117 - val_loss: 0.1109
Epoch 108/200
6/6 - 2s - loss: 0.1093 - val_loss: 0.1216
Epoch 109/200
6/6 - 2s - loss: 0.1093 - val_loss: 0.1051
Epoch 110/200
6/6 - 2s - loss: 0.1106 - val_loss: 0.1168
Epoch 111/200
6/6 - 2s - loss: 0.1079 - val_loss: 0.1077
Epoch 112/200
6/6 - 2s - loss: 0.1052 - val_loss: 0.1069
Epoch 113/200
6/6 - 2s - loss: 0.1036 - val_loss: 0.0929
Epoch 114/200
6/6 - 2s - loss: 0.1041 - val_loss: 0.1029
Epoch 115/200
6/6 - 2s - loss: 0.1043 - val_loss: 0.1396
Epoch 116/200
6/6 - 2s - loss: 0.1073 - val_loss: 0.1229
Epoch 117/200
6/6 - 2s - loss: 0.1072 - val_loss: 0.1083
Epoch 118/200
6/6 - 2s - loss: 0.1132 - val_loss: 0.1073
Epoch 119/200
6/6 - 2s - loss: 0.1169 - val_loss: 0.1486
Epoch 120/200
6/6 - 2s - loss: 0.1183 - val_loss: 0.1386
Epoch 121/200
6/6 - 2s - loss: 0.1236 - val_loss: 0.1458
Epoch 122/200
6/6 - 2s - loss: 0.1308 - val_loss: 0.1179
Epoch 123/200
6/6 - 2s - loss: 0.1174 - val_loss: 0.1359
Epoch 124/200
6/6 - 2s - loss: 0.1090 - val_loss: 0.1118
Epoch 125/200
6/6 - 2s - loss: 0.1188 - val_loss: 0.1660
Epoch 126/200
6/6 - 2s - loss: 0.1165 - val_loss: 0.1174
Epoch 127/200
6/6 - 2s - loss: 0.1218 - val_loss: 0.1329
Epoch 128/200
6/6 - 2s - loss: 0.1183 - val_loss: 0.1074
Epoch 129/200
6/6 - 2s - loss: 0.1056 - val_loss: 0.1219
Epoch 130/200
6/6 - 2s - loss: 0.1061 - val_loss: 0.1019
Epoch 131/200
6/6 - 2s - loss: 0.1030 - val_loss: 0.1094
Epoch 132/200
6/6 - 2s - loss: 0.1010 - val_loss: 0.0977
Epoch 133/200
6/6 - 2s - loss: 0.0974 - val_loss: 0.1105
Epoch 134/200
6/6 - 2s - loss: 0.0937 - val_loss: 0.1031
Epoch 135/200
6/6 - 2s - loss: 0.0992 - val_loss: 0.1067
Epoch 136/200
6/6 - 2s - loss: 0.1077 - val_loss: 0.1284
Epoch 137/200
6/6 - 2s - loss: 0.0994 - val_loss: 0.1096
Epoch 138/200
6/6 - 2s - loss: 0.1100 - val_loss: 0.1158
Epoch 139/200
6/6 - 2s - loss: 0.1047 - val_loss: 0.1129
Epoch 140/200
6/6 - 2s - loss: 0.0983 - val_loss: 0.1411
Epoch 141/200
6/6 - 2s - loss: 0.1021 - val_loss: 0.0994
Epoch 142/200
6/6 - 2s - loss: 0.1059 - val_loss: 0.1056
Epoch 143/200
6/6 - 2s - loss: 0.1011 - val_loss: 0.1144
Epoch 144/200
6/6 - 2s - loss: 0.0944 - val_loss: 0.1242
Epoch 145/200
6/6 - 2s - loss: 0.0963 - val_loss: 0.1066
Epoch 146/200
6/6 - 2s - loss: 0.1068 - val_loss: 0.0975
Epoch 147/200
6/6 - 2s - loss: 0.0968 - val_loss: 0.0985
Epoch 148/200
6/6 - 2s - loss: 0.0882 - val_loss: 0.1289
Epoch 149/200
6/6 - 2s - loss: 0.0927 - val_loss: 0.1022
Epoch 150/200
6/6 - 2s - loss: 0.0974 - val_loss: 0.0919
Epoch 151/200
6/6 - 2s - loss: 0.1055 - val_loss: 0.1241
Epoch 152/200
6/6 - 2s - loss: 0.0928 - val_loss: 0.1378
Epoch 153/200
6/6 - 2s - loss: 0.0974 - val_loss: 0.1092
Epoch 154/200
6/6 - 2s - loss: 0.1049 - val_loss: 0.1223
Epoch 155/200
6/6 - 2s - loss: 0.0956 - val_loss: 0.0978
Epoch 156/200
6/6 - 2s - loss: 0.0969 - val_loss: 0.1415
Epoch 157/200
6/6 - 2s - loss: 0.0948 - val_loss: 0.0908
Epoch 158/200
6/6 - 2s - loss: 0.1004 - val_loss: 0.1237
Epoch 159/200
6/6 - 2s - loss: 0.0943 - val_loss: 0.1207
Epoch 160/200
6/6 - 2s - loss: 0.0956 - val_loss: 0.1179
Epoch 161/200
6/6 - 2s - loss: 0.0941 - val_loss: 0.1195
Epoch 162/200
6/6 - 2s - loss: 0.0980 - val_loss: 0.0911
Epoch 163/200
6/6 - 2s - loss: 0.0943 - val_loss: 0.1105
Epoch 164/200
6/6 - 2s - loss: 0.1002 - val_loss: 0.1153
Epoch 165/200
6/6 - 2s - loss: 0.0900 - val_loss: 0.1410
Epoch 166/200
6/6 - 2s - loss: 0.0919 - val_loss: 0.0981
Epoch 167/200
6/6 - 2s - loss: 0.0926 - val_loss: 0.1179
Epoch 168/200
6/6 - 2s - loss: 0.0868 - val_loss: 0.1502
Epoch 169/200
6/6 - 2s - loss: 0.0932 - val_loss: 0.1249
Epoch 170/200
6/6 - 2s - loss: 0.0994 - val_loss: 0.0947
Epoch 171/200
6/6 - 2s - loss: 0.0994 - val_loss: 0.1368
Epoch 172/200
6/6 - 2s - loss: 0.0901 - val_loss: 0.1270
Epoch 173/200
6/6 - 2s - loss: 0.0946 - val_loss: 0.0928
Epoch 174/200
6/6 - 2s - loss: 0.1036 - val_loss: 0.1653
Epoch 175/200
6/6 - 2s - loss: 0.1076 - val_loss: 0.0886
Epoch 176/200
6/6 - 2s - loss: 0.1176 - val_loss: 0.1641
Epoch 177/200
6/6 - 2s - loss: 0.1123 - val_loss: 0.1174
Epoch 178/200
6/6 - 2s - loss: 0.0941 - val_loss: 0.1298
Epoch 179/200
6/6 - 2s - loss: 0.0970 - val_loss: 0.1112
Epoch 180/200
6/6 - 2s - loss: 0.0910 - val_loss: 0.1283
Epoch 181/200
6/6 - 2s - loss: 0.0907 - val_loss: 0.1184
Epoch 182/200
6/6 - 2s - loss: 0.0871 - val_loss: 0.1005
Epoch 183/200
6/6 - 2s - loss: 0.1026 - val_loss: 0.1878
Epoch 184/200
6/6 - 2s - loss: 0.1030 - val_loss: 0.1073
Epoch 185/200
6/6 - 2s - loss: 0.0977 - val_loss: 0.1467
Epoch 186/200
6/6 - 2s - loss: 0.1006 - val_loss: 0.1187
Epoch 187/200
6/6 - 2s - loss: 0.1058 - val_loss: 0.1955
Epoch 188/200
6/6 - 2s - loss: 0.1169 - val_loss: 0.1158
Epoch 189/200
6/6 - 2s - loss: 0.1017 - val_loss: 0.1420
Epoch 190/200
6/6 - 2s - loss: 0.1089 - val_loss: 0.1545
Epoch 191/200
6/6 - 2s - loss: 0.1269 - val_loss: 0.1908
Epoch 192/200
6/6 - 2s - loss: 0.1239 - val_loss: 0.1826
Epoch 193/200
6/6 - 2s - loss: 0.1392 - val_loss: 0.1671
Epoch 194/200
6/6 - 2s - loss: 0.1519 - val_loss: 0.1417
Epoch 195/200
6/6 - 2s - loss: 0.1767 - val_loss: 0.1723
Epoch 196/200
6/6 - 2s - loss: 0.1820 - val_loss: 0.1838
Epoch 197/200
6/6 - 2s - loss: 0.1813 - val_loss: 0.2253
Epoch 198/200
6/6 - 2s - loss: 0.1748 - val_loss: 0.2085
Epoch 199/200
6/6 - 2s - loss: 0.1737 - val_loss: 0.1862
Epoch 200/200
6/6 - 2s - loss: 0.1732 - val_loss: 0.1434
```

```
10it [77:16:48, 27820.85s/it]
```

Выводим оценки результатов работы сети

In [11]:

```
print('Средний R2 для суммарного дебита: ', np.array(R2_sum).mean())
print('Средний MAE для суммарного дебита: ', np.array(MAE_sum).mean())
print('Средний MSE для суммарного дебита: ', np.array(MSE_sum).mean())
print('Средний MAPE для суммарного дебита: ', np.array(MAPE_sum).mean())
print('Медианный MAPE для суммарного дебита: ', np.array(MMAPE_sum).mean())

print('Средний медианный R2 по экспериментам: ', np.array(R2_median_pw).mean())
print('Средний MAE по экспериментам: ', np.array(MAE_mean_pw).mean())
print('Средний MSE по экспериментам: ', np.array(MSE_mean_pw).mean())
print('Средний MAPE по экспериментам: ', np.array(MAPE_mean_pw).mean())
print('Медианный MAPE по экспериментам: ', np.array(MAPE_median_pw).mean())
```

```
Средний R2 для суммарного дебита:  0.9849860621963972
Средний MAE для суммарного дебита:  47.946394183864776
Средний MSE для суммарного дебита:  5748.576419518755
Средний MAPE для суммарного дебита:  5.856212510607195
Медианный MAPE для суммарного дебита:  4.63432133644403
Средний медианный R2 по экспериментам:  0.8423165308821584
Средний MAE по экспериментам:  4.726912257648467
Средний MSE по экспериментам:  129.27777761970378
Средний MAPE по экспериментам:  10.781858237527436
Медианный MAPE по экспериментам:  8.858505673680288
```

In [12]:

```
dfsave=pd.DataFrame({'r2_sum':R2_sum,'mae_sum':MAE_sum,'mse_sum':MSE_sum,'mape_sum':MAPE_sum,'mmape_su
m':MMAPE_sum,
                     'r2_pw':R2_median_pw,'mae_pw':MAE_mean_pw,'mse_pw':MSE_mean_pw,'mape_pw':MAPE_mean_
pw,'mmape_pw':MAPE_median_pw})
dfsave.to_csv(f'results_{ind}.csv')
```

Выводим график обучения сети на последней итерации 10-блочной кросс-валидации

In [13]:

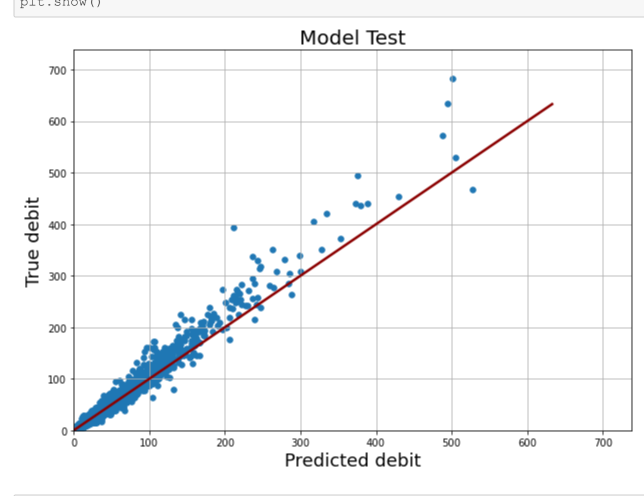
```
plt.plot(histories[9].history['loss'])
plt.plot(histories[9].history['val_loss'])
plt.title('model loss')
plt.ylabel('loss')
plt.xlabel('epoch')
plt.legend(['train', 'test'], loc='upper left')
plt.show()
```


Сравнение предсказанных значений истинным

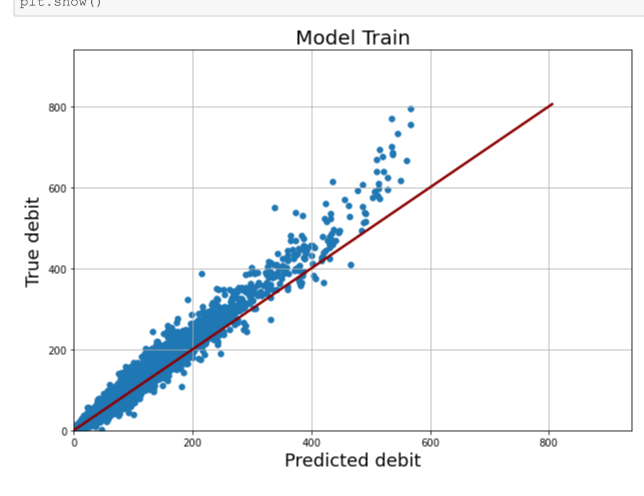
In [14]:
```python
yy = test_y_transformed[:50] * scaler_y
pp = model.predict(test_x_transformed[:50]).reshape(test_y_transformed[:50].shape)

pp = pp*scaler_y
plt.figure(figsize=(20, 5))

for idx, i in enumerate(zip(yy.iterrows(), pp)):
    plt.figure(figsize=(20, 5))

    plt.plot(np.arange(n_timesteps)+2010, i[0][1], 'b', label='Истинный дебит')
    a = i[1]

    plt.plot(np.arange(n_timesteps)+2010, a, 'r', label='Предсказанный дебит')
    plt.legend()
    plt.xlabel('ГОД')
    plt.ylabel('Predicted debit')
    plt.grid()
    plt.show()
```

```
<Figure size 1440x360 with 0 Axes>
```

In [15]:
```python
y_p = test_y_transformed * scaler_y
p_y = model.predict(test_x_transformed).reshape(test_y_transformed.shape)
p_y=p_y*scaler_y
xlabel = p_y
ylabel = y_p
plt.figure(figsize=(10,7))

plt.scatter(xlabel, ylabel,s=30,zorder=1)
plt.title(f'Model Test',fontsize=20)
plt.ylabel('True debit',fontsize=18)
plt.xlabel('Predicted debit',fontsize=18)

xmp2 = [0,xlabel.max()*1.2]
ymp2 = [0,xlabel.max()*1.2]

plt.plot(xmp2, ymp2, label = "line 2",c='darkred',linewidth=2.5,zorder=2)
plt.ylim(0,xlabel.max()*1.4)
plt.xlim(0,xlabel.max()*1.4)
plt.grid()
plt.show()
```



In [16]:
```python
y_p = train_y_transformed * scaler_y
p_y = model.predict(train_x_transformed).reshape(train_y_transformed.shape)
p_y=p_y*scaler_y
xlabel = p_y
ylabel = y_p
plt.figure(figsize=(10,7))

plt.scatter(xlabel, ylabel,s=30,zorder=1)
plt.title(f'Model Train',fontsize=20)
plt.ylabel('True debit',fontsize=18)
plt.xlabel('Predicted debit',fontsize=18)

xmp2 = [0,xlabel.max()*1.2]
ymp2 = [0,xlabel.max()*1.2]
# plotting the line 2 points
plt.plot(xmp2, ymp2, label = "line 2",c='darkred',linewidth=2.5,zorder=2)
plt.ylim(0,xlabel.max()*1.4)
plt.xlim(0,xlabel.max()*1.4)
plt.grid()
plt.show()
```



In [17]:

```
X_transformed=scaler_X.fit_transform(np.array(X))
pred_all =  model.predict(X_transformed)
pred_all = pred_all * scaler_y
pred_all[pred_all < 0] = 0
p_y_=pd.DataFrame({'debit_summ':Y.sum(axis=1)})
p_y_['predicted'] = pred_all.sum(axis=1)
print(len(p_y_))
print(len(X))
ranged = p_y_.iloc[np.argsort(p_y_.debit_summ.values)[::-1]]
ranged.index = list(range(len(ranged)))

ranged.loc[np.argsort(ranged.predicted.values)[::-1] , 'place_ml'] = list(range(len(ranged)))
ranged['place_ml'] = ranged['place_ml'].astype('int64')
ranged[0:10]
```

```
1478
1478
```

Out[17]:

	debit_summ	predicted	place_ml
0	3810.275864	2856.936279	4
1	3682.925773	2904.816162	3
2	3510.132787	3019.693604	1
3	3324.266232	2628.070312	14
4	3322.636049	2731.246582	8
5	3272.103526	2978.948730	2
6	3255.472605	3144.968506	0
7	3252.159600	2603.178223	15
8	3230.370258	2760.041260	7
9	3066.018461	2727.626709	9

In [ ]:

In [ ]:

In [ ]: