hayan-ann-stock-prediction-updated

October 5, 2024

```python
[15]: import numpy as np
      import matplotlib.pyplot as plt
      from tensorflow.keras.models import Sequential
      from tensorflow.keras.layers import Dense
      from tensorflow.keras.optimizers import Nadam
      from sklearn.model_selection import train_test_split
      from sklearn.preprocessing import StandardScaler
      import pandas as pd
      from tensorflow.keras.callbacks import ReduceLROnPlateau
      from tensorflow.keras import backend as K
      from keras.layers import Dropout
```

```python
[16]: data = pd.read_csv('nifty50_latest_data.csv')
```

```python
[17]: data
```

```
[17]:             Date      Open      High       Low     Close  Shares Traded  \
      0    17-APR-2023  17863.00  17863.00  17574.05  17706.85      357401212
      1    18-APR-2023  17766.60  17766.60  17610.20  17660.15      258856690
      2    19-APR-2023  17653.35  17666.15  17579.85  17618.75      281463379
      3    20-APR-2023  17638.60  17684.45  17584.35  17624.45      215103396
      4    21-APR-2023  17639.75  17663.20  17553.95  17624.05      230156645
      ..           ...       ...       ...       ...       ...            ...
      245  09-APR-2024  22765.10  22768.40  22612.25  22642.75      232356772
      246  10-APR-2024  22720.25  22775.70  22673.70  22753.80      276847931
      247  12-APR-2024  22677.40  22726.45  22503.75  22519.40      357187778
      248  15-APR-2024  22339.05  22427.45  22259.55  22272.50      355465814
      249  16-APR-2024  22125.30  22213.75  22079.45  22147.90      317267066

           Turnover ( Cr)
      0          35118.57
      1          23032.99
      2          21562.08
      3          19457.45
      4          19091.44
      ..              ...
      245        21651.69
```

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246          25355.05
247          36456.91
248          29474.59
249          28661.04

[250 rows x 7 columns]
```

[35]:
```
X = data.iloc[:,[1,2,3,4]].values.astype(float)
y = data.iloc[:,[4]].values.astype(float)
```

[36]:
```
y
```

[36]:
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```

[37]:
```python
X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2,
 ↪random_state=42)
```

[38]:
```python
sc = StandardScaler()
X_train = sc.fit_transform(X_train)
X_test = sc.transform(X_test)
```

[39]:
```python
reduce_lr = ReduceLROnPlateau(monitor='val_loss', factor=0.2, patience=2,
 ↪min_lr=0.00001)
```

[40]:
```python
def r_squared(y_true, y_pred):
    SS_res =  K.sum(K.square(y_true - y_pred))
    SS_tot = K.sum(K.square(y_true - K.mean(y_true)))
    return (1 - SS_res/(SS_tot + K.epsilon()))
```

[44]:
```python
#ANN Model of Selection by Syed Laraib
model = Sequential()
model.add(Dense(units=1500, activation='relu', input_dim=4))  # Input layer
model.add(Dropout(0.2))
```

```python
model.add(Dense(units=1250, activation='relu'))  # Hidden Layer 1
model.add(Dropout(0.2))
model.add(Dense(units=1000, activation='relu'))  # Hidden layer 2
model.add(Dropout(0.2))
model.add(Dense(units=750, activation='relu'))  # Hidden layer 3
model.add(Dropout(0.2))
model.add(Dense(units=500, activation='relu'))  # Hidden layer 4
model.add(Dropout(0.2))
model.add(Dense(units=250, activation='relu'))  # Hidden layer 5
model.add(Dropout(0.2))
model.add(Dense(units=1, activation='linear')) #Output layer
```

[47]:
```python
model.compile(loss='mean_squared_logarithmic_error',
    optimizer=Nadam(learning_rate=0.0001), metrics=[r_squared])
```

[48]:
```python
history = model.fit(X_train, y_train, validation_data=(X_test, y_test),
    epochs=1000, batch_size=16, verbose=1, callbacks=[reduce_lr])
```

```
Epoch 1/1000
13/13 [==============================] - 3s 38ms/step - loss: 0.0047 -
r_squared: -0.0879 - val_loss: 3.7012e-04 - val_r_squared: 0.9194 - lr:
1.0000e-04
Epoch 2/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: 0.1001 - val_loss: 5.3034e-04 - val_r_squared: 0.8900 - lr:
1.0000e-04
Epoch 3/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.1037 - val_loss: 3.2927e-04 - val_r_squared: 0.9350 - lr:
1.0000e-04
Epoch 4/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: 0.0197 - val_loss: 1.2851e-05 - val_r_squared: 0.9975 - lr:
2.0000e-05
Epoch 5/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0041 -
r_squared: 0.1039 - val_loss: 3.5917e-05 - val_r_squared: 0.9936 - lr:
2.0000e-05
Epoch 6/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0055 -
r_squared: -0.2560 - val_loss: 5.1562e-05 - val_r_squared: 0.9901 - lr:
2.0000e-05
Epoch 7/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0056 -
r_squared: -0.3213 - val_loss: 1.9358e-04 - val_r_squared: 0.9649 - lr:
1.0000e-05
Epoch 8/1000
```

```
13/13 [==============================] - 0s 23ms/step - loss: 0.0051 -
r_squared: -0.3511 - val_loss: 5.3263e-05 - val_r_squared: 0.9907 - lr:
1.0000e-05
Epoch 9/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: 0.0083 - val_loss: 6.7827e-06 - val_r_squared: 0.9983 - lr:
1.0000e-05
Epoch 10/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.0381 - val_loss: 2.9581e-05 - val_r_squared: 0.9944 - lr:
1.0000e-05
Epoch 11/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: 0.0859 - val_loss: 2.6676e-05 - val_r_squared: 0.9949 - lr:
1.0000e-05
Epoch 12/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0039 -
r_squared: 0.0281 - val_loss: 5.2213e-05 - val_r_squared: 0.9888 - lr:
1.0000e-05
Epoch 13/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0058 -
r_squared: -0.4082 - val_loss: 1.3129e-04 - val_r_squared: 0.9745 - lr:
1.0000e-05
Epoch 14/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.2453 - val_loss: 5.7604e-05 - val_r_squared: 0.9889 - lr:
1.0000e-05
Epoch 15/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.1472 - val_loss: 3.1802e-05 - val_r_squared: 0.9921 - lr:
1.0000e-05
Epoch 16/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0040 -
r_squared: 0.0462 - val_loss: 2.0095e-05 - val_r_squared: 0.9967 - lr:
1.0000e-05
Epoch 17/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.1179 - val_loss: 5.3056e-05 - val_r_squared: 0.9910 - lr:
1.0000e-05
Epoch 18/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.6958 - val_loss: 1.2570e-05 - val_r_squared: 0.9978 - lr:
1.0000e-05
Epoch 19/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.1741 - val_loss: 2.9107e-05 - val_r_squared: 0.9944 - lr:
1.0000e-05
Epoch 20/1000
```

```
13/13 [==============================] - 0s 23ms/step - loss: 0.0050 -
r_squared: -0.1026 - val_loss: 7.4643e-05 - val_r_squared: 0.9862 - lr:
1.0000e-05
Epoch 21/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.1071 - val_loss: 1.2654e-05 - val_r_squared: 0.9979 - lr:
1.0000e-05
Epoch 22/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.2123 - val_loss: 1.6134e-05 - val_r_squared: 0.9969 - lr:
1.0000e-05
Epoch 23/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0050 -
r_squared: -0.2291 - val_loss: 9.1696e-05 - val_r_squared: 0.9819 - lr:
1.0000e-05
Epoch 24/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: -0.0889 - val_loss: 1.5870e-05 - val_r_squared: 0.9971 - lr:
1.0000e-05
Epoch 25/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.1169 - val_loss: 5.5637e-05 - val_r_squared: 0.9892 - lr:
1.0000e-05
Epoch 26/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0414 - val_loss: 6.1661e-05 - val_r_squared: 0.9878 - lr:
1.0000e-05
Epoch 27/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0052 -
r_squared: -0.2902 - val_loss: 6.2405e-05 - val_r_squared: 0.9876 - lr:
1.0000e-05
Epoch 28/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0051 -
r_squared: -0.2615 - val_loss: 4.1932e-06 - val_r_squared: 0.9991 - lr:
1.0000e-05
Epoch 29/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.0854 - val_loss: 3.8513e-05 - val_r_squared: 0.9908 - lr:
1.0000e-05
Epoch 30/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.1434 - val_loss: 1.6167e-04 - val_r_squared: 0.9709 - lr:
1.0000e-05
Epoch 31/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0051 -
r_squared: -0.2906 - val_loss: 5.8750e-06 - val_r_squared: 0.9989 - lr:
1.0000e-05
Epoch 32/1000
```

```
13/13 [==============================] - 0s 22ms/step - loss: 0.0053 -
r_squared: -0.1721 - val_loss: 1.4597e-05 - val_r_squared: 0.9972 - lr:
1.0000e-05
Epoch 33/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0051 -
r_squared: -0.5125 - val_loss: 8.6185e-05 - val_r_squared: 0.9831 - lr:
1.0000e-05
Epoch 34/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0055 -
r_squared: -0.7174 - val_loss: 3.6685e-05 - val_r_squared: 0.9938 - lr:
1.0000e-05
Epoch 35/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0045 -
r_squared: -0.1556 - val_loss: 6.1391e-05 - val_r_squared: 0.9863 - lr:
1.0000e-05
Epoch 36/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.1903 - val_loss: 2.3046e-05 - val_r_squared: 0.9962 - lr:
1.0000e-05
Epoch 37/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0055 -
r_squared: -0.3466 - val_loss: 1.2533e-05 - val_r_squared: 0.9970 - lr:
1.0000e-05
Epoch 38/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.0411 - val_loss: 9.9463e-06 - val_r_squared: 0.9977 - lr:
1.0000e-05
Epoch 39/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0054 -
r_squared: -0.3273 - val_loss: 2.5763e-05 - val_r_squared: 0.9956 - lr:
1.0000e-05
Epoch 40/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.1189 - val_loss: 6.8226e-05 - val_r_squared: 0.9879 - lr:
1.0000e-05
Epoch 41/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0053 -
r_squared: -0.2169 - val_loss: 9.3690e-06 - val_r_squared: 0.9978 - lr:
1.0000e-05
Epoch 42/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0051 -
r_squared: -0.1587 - val_loss: 3.1450e-05 - val_r_squared: 0.9948 - lr:
1.0000e-05
Epoch 43/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0825 - val_loss: 1.0875e-05 - val_r_squared: 0.9974 - lr:
1.0000e-05
Epoch 44/1000
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13/13 [==============================] - 0s 22ms/step - loss: 0.0053 -
r_squared: -0.2098 - val_loss: 1.8774e-05 - val_r_squared: 0.9966 - lr:
1.0000e-05
Epoch 45/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.0832 - val_loss: 3.1357e-05 - val_r_squared: 0.9945 - lr:
1.0000e-05
Epoch 46/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0043 -
r_squared: 0.0496 - val_loss: 1.7521e-05 - val_r_squared: 0.9967 - lr:
1.0000e-05
Epoch 47/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0055 -
r_squared: -0.3291 - val_loss: 5.5466e-05 - val_r_squared: 0.9888 - lr:
1.0000e-05
Epoch 48/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0053 -
r_squared: -0.1836 - val_loss: 2.0708e-05 - val_r_squared: 0.9957 - lr:
1.0000e-05
Epoch 49/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0040 -
r_squared: 0.1158 - val_loss: 5.4103e-05 - val_r_squared: 0.9869 - lr:
1.0000e-05
Epoch 50/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.1702 - val_loss: 6.4369e-05 - val_r_squared: 0.9866 - lr:
1.0000e-05
Epoch 51/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: -0.0096 - val_loss: 6.9510e-05 - val_r_squared: 0.9880 - lr:
1.0000e-05
Epoch 52/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.2193 - val_loss: 4.6133e-05 - val_r_squared: 0.9923 - lr:
1.0000e-05
Epoch 53/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0043 -
r_squared: -0.1321 - val_loss: 9.4474e-06 - val_r_squared: 0.9983 - lr:
1.0000e-05
Epoch 54/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0048 -
r_squared: -0.1230 - val_loss: 1.7556e-05 - val_r_squared: 0.9971 - lr:
1.0000e-05
Epoch 55/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0052 -
r_squared: -0.0775 - val_loss: 2.5275e-05 - val_r_squared: 0.9958 - lr:
1.0000e-05
Epoch 56/1000
```

```
13/13 [==============================] - 0s 21ms/step - loss: 0.0046 -
r_squared: -0.1119 - val_loss: 4.0475e-05 - val_r_squared: 0.9906 - lr:
1.0000e-05
Epoch 57/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.1549 - val_loss: 1.9661e-04 - val_r_squared: 0.9575 - lr:
1.0000e-05
Epoch 58/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0047 -
r_squared: -0.1215 - val_loss: 2.0890e-04 - val_r_squared: 0.9641 - lr:
1.0000e-05
Epoch 59/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0052 -
r_squared: -0.1562 - val_loss: 3.1875e-05 - val_r_squared: 0.9939 - lr:
1.0000e-05
Epoch 60/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.1172 - val_loss: 1.7324e-04 - val_r_squared: 0.9666 - lr:
1.0000e-05
Epoch 61/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0054 -
r_squared: -0.2449 - val_loss: 1.1789e-04 - val_r_squared: 0.9781 - lr:
1.0000e-05
Epoch 62/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0051 -
r_squared: -0.1762 - val_loss: 5.5153e-05 - val_r_squared: 0.9898 - lr:
1.0000e-05
Epoch 63/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.0850 - val_loss: 7.5391e-06 - val_r_squared: 0.9987 - lr:
1.0000e-05
Epoch 64/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.0528 - val_loss: 2.6201e-05 - val_r_squared: 0.9956 - lr:
1.0000e-05
Epoch 65/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.1792 - val_loss: 9.5198e-05 - val_r_squared: 0.9829 - lr:
1.0000e-05
Epoch 66/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: 0.0351 - val_loss: 8.7215e-05 - val_r_squared: 0.9840 - lr:
1.0000e-05
Epoch 67/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.2539 - val_loss: 1.9081e-05 - val_r_squared: 0.9969 - lr:
1.0000e-05
Epoch 68/1000
```

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13/13 [==============================] - 0s 23ms/step - loss: 0.0053 -
r_squared: -0.1919 - val_loss: 5.1760e-05 - val_r_squared: 0.9913 - lr:
1.0000e-05
Epoch 69/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.2232 - val_loss: 2.2390e-05 - val_r_squared: 0.9949 - lr:
1.0000e-05
Epoch 70/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: -1.1061 - val_loss: 3.3746e-05 - val_r_squared: 0.9930 - lr:
1.0000e-05
Epoch 71/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0039 -
r_squared: 0.1090 - val_loss: 4.7082e-05 - val_r_squared: 0.9922 - lr:
1.0000e-05
Epoch 72/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.1125 - val_loss: 8.6243e-06 - val_r_squared: 0.9982 - lr:
1.0000e-05
Epoch 73/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.0223 - val_loss: 7.4489e-06 - val_r_squared: 0.9985 - lr:
1.0000e-05
Epoch 74/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0039 -
r_squared: 0.0650 - val_loss: 8.0943e-06 - val_r_squared: 0.9985 - lr:
1.0000e-05
Epoch 75/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.0405 - val_loss: 5.7502e-05 - val_r_squared: 0.9885 - lr:
1.0000e-05
Epoch 76/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0045 -
r_squared: -0.1838 - val_loss: 3.0927e-05 - val_r_squared: 0.9939 - lr:
1.0000e-05
Epoch 77/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0053 -
r_squared: -0.3531 - val_loss: 8.8043e-06 - val_r_squared: 0.9977 - lr:
1.0000e-05
Epoch 78/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0047 -
r_squared: -0.1213 - val_loss: 1.0655e-05 - val_r_squared: 0.9975 - lr:
1.0000e-05
Epoch 79/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0044 -
r_squared: -0.4357 - val_loss: 2.7167e-05 - val_r_squared: 0.9933 - lr:
1.0000e-05
Epoch 80/1000
```

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13/13 [==============================] - 0s 24ms/step - loss: 0.0052 -
r_squared: -0.2404 - val_loss: 7.9363e-06 - val_r_squared: 0.9980 - lr:
1.0000e-05
Epoch 81/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.1563 - val_loss: 1.3703e-05 - val_r_squared: 0.9977 - lr:
1.0000e-05
Epoch 82/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0041 -
r_squared: 0.0392 - val_loss: 2.1584e-04 - val_r_squared: 0.9602 - lr:
1.0000e-05
Epoch 83/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0049 -
r_squared: -0.1483 - val_loss: 3.5157e-05 - val_r_squared: 0.9935 - lr:
1.0000e-05
Epoch 84/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: 0.0033 - val_loss: 8.0109e-05 - val_r_squared: 0.9842 - lr:
1.0000e-05
Epoch 85/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0059 -
r_squared: -0.3146 - val_loss: 1.6338e-04 - val_r_squared: 0.9711 - lr:
1.0000e-05
Epoch 86/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0044 -
r_squared: -0.0913 - val_loss: 3.4322e-05 - val_r_squared: 0.9932 - lr:
1.0000e-05
Epoch 87/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0051 -
r_squared: -0.1796 - val_loss: 1.5337e-05 - val_r_squared: 0.9971 - lr:
1.0000e-05
Epoch 88/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.0371 - val_loss: 6.0500e-06 - val_r_squared: 0.9985 - lr:
1.0000e-05
Epoch 89/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.3808 - val_loss: 6.0349e-05 - val_r_squared: 0.9899 - lr:
1.0000e-05
Epoch 90/1000
13/13 [==============================] - 0s 20ms/step - loss: 0.0050 -
r_squared: -0.1845 - val_loss: 2.0293e-05 - val_r_squared: 0.9966 - lr:
1.0000e-05
Epoch 91/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0052 -
r_squared: -0.1951 - val_loss: 7.3924e-06 - val_r_squared: 0.9985 - lr:
1.0000e-05
Epoch 92/1000
```

```
13/13 [==============================] - 0s 21ms/step - loss: 0.0049 -
r_squared: -0.0789 - val_loss: 2.6362e-05 - val_r_squared: 0.9957 - lr:
1.0000e-05
Epoch 93/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0038 -
r_squared: 0.0618 - val_loss: 4.2090e-05 - val_r_squared: 0.9929 - lr:
1.0000e-05
Epoch 94/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0042 -
r_squared: 0.1017 - val_loss: 3.8699e-05 - val_r_squared: 0.9925 - lr:
1.0000e-05
Epoch 95/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0057 -
r_squared: -0.5610 - val_loss: 1.2267e-04 - val_r_squared: 0.9790 - lr:
1.0000e-05
Epoch 96/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0038 -
r_squared: 0.0587 - val_loss: 3.3606e-05 - val_r_squared: 0.9936 - lr:
1.0000e-05
Epoch 97/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0048 -
r_squared: -0.0972 - val_loss: 3.1918e-05 - val_r_squared: 0.9947 - lr:
1.0000e-05
Epoch 98/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0049 -
r_squared: -0.7419 - val_loss: 4.3113e-05 - val_r_squared: 0.9900 - lr:
1.0000e-05
Epoch 99/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0048 -
r_squared: -0.1399 - val_loss: 3.2502e-05 - val_r_squared: 0.9928 - lr:
1.0000e-05
Epoch 100/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.0490 - val_loss: 4.2245e-05 - val_r_squared: 0.9918 - lr:
1.0000e-05
Epoch 101/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0045 -
r_squared: -0.1974 - val_loss: 5.2598e-05 - val_r_squared: 0.9895 - lr:
1.0000e-05
Epoch 102/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0043 -
r_squared: -0.1725 - val_loss: 3.3219e-05 - val_r_squared: 0.9938 - lr:
1.0000e-05
Epoch 103/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0045 -
r_squared: -0.0694 - val_loss: 2.7182e-05 - val_r_squared: 0.9941 - lr:
1.0000e-05
Epoch 104/1000
```

```
13/13 [==============================] - 0s 21ms/step - loss: 0.0053 -
r_squared: -0.1654 - val_loss: 1.5642e-04 - val_r_squared: 0.9718 - lr:
1.0000e-05
Epoch 105/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.0671 - val_loss: 5.9459e-05 - val_r_squared: 0.9899 - lr:
1.0000e-05
Epoch 106/1000
13/13 [==============================] - 0s 20ms/step - loss: 0.0051 -
r_squared: -0.1617 - val_loss: 6.5728e-05 - val_r_squared: 0.9888 - lr:
1.0000e-05
Epoch 107/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0045 -
r_squared: -4.8838e-04 - val_loss: 6.4875e-05 - val_r_squared: 0.9888 - lr:
1.0000e-05
Epoch 108/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0040 -
r_squared: -0.0866 - val_loss: 6.4681e-05 - val_r_squared: 0.9849 - lr:
1.0000e-05
Epoch 109/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0049 -
r_squared: -0.0439 - val_loss: 2.4993e-04 - val_r_squared: 0.9536 - lr:
1.0000e-05
Epoch 110/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0043 -
r_squared: -0.0561 - val_loss: 7.1120e-05 - val_r_squared: 0.9872 - lr:
1.0000e-05
Epoch 111/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0053 -
r_squared: -0.4515 - val_loss: 2.9315e-04 - val_r_squared: 0.9429 - lr:
1.0000e-05
Epoch 112/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0051 -
r_squared: -0.2992 - val_loss: 6.5921e-06 - val_r_squared: 0.9987 - lr:
1.0000e-05
Epoch 113/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0050 -
r_squared: -0.1735 - val_loss: 2.0158e-04 - val_r_squared: 0.9607 - lr:
1.0000e-05
Epoch 114/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0045 -
r_squared: -0.0794 - val_loss: 3.9611e-05 - val_r_squared: 0.9928 - lr:
1.0000e-05
Epoch 115/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0044 -
r_squared: -0.2183 - val_loss: 8.6854e-06 - val_r_squared: 0.9983 - lr:
1.0000e-05
Epoch 116/1000
```

```
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0076 - val_loss: 7.1372e-06 - val_r_squared: 0.9986 - lr:
1.0000e-05
Epoch 117/1000
13/13 [==============================] - 0s 20ms/step - loss: 0.0044 -
r_squared: 0.0172 - val_loss: 3.6990e-05 - val_r_squared: 0.9929 - lr:
1.0000e-05
Epoch 118/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0044 -
r_squared: -0.0439 - val_loss: 1.6376e-05 - val_r_squared: 0.9961 - lr:
1.0000e-05
Epoch 119/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0054 -
r_squared: -0.2746 - val_loss: 3.0321e-05 - val_r_squared: 0.9928 - lr:
1.0000e-05
Epoch 120/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.1590 - val_loss: 2.0403e-05 - val_r_squared: 0.9965 - lr:
1.0000e-05
Epoch 121/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1700 - val_loss: 1.3159e-04 - val_r_squared: 0.9696 - lr:
1.0000e-05
Epoch 122/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.0563 - val_loss: 7.1971e-05 - val_r_squared: 0.9878 - lr:
1.0000e-05
Epoch 123/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0051 -
r_squared: -0.2300 - val_loss: 1.4972e-05 - val_r_squared: 0.9966 - lr:
1.0000e-05
Epoch 124/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0040 -
r_squared: 0.0921 - val_loss: 4.3781e-06 - val_r_squared: 0.9990 - lr:
1.0000e-05
Epoch 125/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.2807 - val_loss: 7.2681e-05 - val_r_squared: 0.9870 - lr:
1.0000e-05
Epoch 126/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0042 -
r_squared: -0.1980 - val_loss: 3.2753e-05 - val_r_squared: 0.9946 - lr:
1.0000e-05
Epoch 127/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0041 -
r_squared: 0.0712 - val_loss: 2.6761e-05 - val_r_squared: 0.9934 - lr:
1.0000e-05
Epoch 128/1000
```

```
13/13 [==============================] - 0s 21ms/step - loss: 0.0047 -
r_squared: -0.2958 - val_loss: 2.4494e-05 - val_r_squared: 0.9960 - lr:
1.0000e-05
Epoch 129/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0031 -
r_squared: 0.2536 - val_loss: 1.5579e-05 - val_r_squared: 0.9973 - lr:
1.0000e-05
Epoch 130/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.1395 - val_loss: 1.2160e-05 - val_r_squared: 0.9978 - lr:
1.0000e-05
Epoch 131/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0051 -
r_squared: -0.1092 - val_loss: 1.4015e-04 - val_r_squared: 0.9734 - lr:
1.0000e-05
Epoch 132/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0040 -
r_squared: -5.0552e-04 - val_loss: 1.7575e-05 - val_r_squared: 0.9967 - lr:
1.0000e-05
Epoch 133/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: 0.0157 - val_loss: 4.7151e-06 - val_r_squared: 0.9992 - lr:
1.0000e-05
Epoch 134/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0048 -
r_squared: -0.1290 - val_loss: 3.0928e-06 - val_r_squared: 0.9993 - lr:
1.0000e-05
Epoch 135/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1332 - val_loss: 4.7509e-05 - val_r_squared: 0.9912 - lr:
1.0000e-05
Epoch 136/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0044 -
r_squared: -0.0376 - val_loss: 2.9607e-05 - val_r_squared: 0.9951 - lr:
1.0000e-05
Epoch 137/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0046 -
r_squared: -0.0714 - val_loss: 7.2860e-06 - val_r_squared: 0.9981 - lr:
1.0000e-05
Epoch 138/1000
13/13 [==============================] - 0s 20ms/step - loss: 0.0051 -
r_squared: -0.2073 - val_loss: 6.7414e-06 - val_r_squared: 0.9985 - lr:
1.0000e-05
Epoch 139/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0043 -
r_squared: -0.0593 - val_loss: 1.3356e-05 - val_r_squared: 0.9975 - lr:
1.0000e-05
Epoch 140/1000
```

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13/13 [==============================] - 0s 21ms/step - loss: 0.0046 -
r_squared: 0.0370 - val_loss: 5.5285e-05 - val_r_squared: 0.9889 - lr:
1.0000e-05
Epoch 141/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0053 -
r_squared: -0.3715 - val_loss: 1.3219e-04 - val_r_squared: 0.9719 - lr:
1.0000e-05
Epoch 142/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0041 -
r_squared: -0.0037 - val_loss: 2.8078e-05 - val_r_squared: 0.9949 - lr:
1.0000e-05
Epoch 143/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0053 -
r_squared: -0.1866 - val_loss: 5.5996e-06 - val_r_squared: 0.9990 - lr:
1.0000e-05
Epoch 144/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0038 -
r_squared: -0.0466 - val_loss: 1.3342e-05 - val_r_squared: 0.9972 - lr:
1.0000e-05
Epoch 145/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0048 -
r_squared: -0.0683 - val_loss: 1.1971e-05 - val_r_squared: 0.9980 - lr:
1.0000e-05
Epoch 146/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0045 -
r_squared: -0.1819 - val_loss: 1.1311e-05 - val_r_squared: 0.9973 - lr:
1.0000e-05
Epoch 147/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0048 -
r_squared: -0.0720 - val_loss: 3.9648e-05 - val_r_squared: 0.9911 - lr:
1.0000e-05
Epoch 148/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0041 -
r_squared: 0.0697 - val_loss: 1.0739e-04 - val_r_squared: 0.9758 - lr:
1.0000e-05
Epoch 149/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0049 -
r_squared: -0.1251 - val_loss: 1.0537e-04 - val_r_squared: 0.9805 - lr:
1.0000e-05
Epoch 150/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0046 -
r_squared: -0.0722 - val_loss: 1.8380e-05 - val_r_squared: 0.9967 - lr:
1.0000e-05
Epoch 151/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1778 - val_loss: 5.7578e-05 - val_r_squared: 0.9877 - lr:
1.0000e-05
Epoch 152/1000
```

```
13/13 [==============================] - 0s 22ms/step - loss: 0.0040 -
r_squared: 0.0376 - val_loss: 2.2056e-05 - val_r_squared: 0.9961 - lr:
1.0000e-05
Epoch 153/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0052 -
r_squared: -0.4272 - val_loss: 5.1127e-05 - val_r_squared: 0.9880 - lr:
1.0000e-05
Epoch 154/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0055 -
r_squared: -0.2268 - val_loss: 1.2123e-04 - val_r_squared: 0.9783 - lr:
1.0000e-05
Epoch 155/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0052 -
r_squared: -0.2795 - val_loss: 2.4585e-04 - val_r_squared: 0.9571 - lr:
1.0000e-05
Epoch 156/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1906 - val_loss: 4.3049e-05 - val_r_squared: 0.9926 - lr:
1.0000e-05
Epoch 157/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0056 -
r_squared: -0.4242 - val_loss: 4.0016e-05 - val_r_squared: 0.9921 - lr:
1.0000e-05
Epoch 158/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0048 -
r_squared: -0.1469 - val_loss: 7.9020e-05 - val_r_squared: 0.9837 - lr:
1.0000e-05
Epoch 159/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0052 -
r_squared: -0.0875 - val_loss: 1.0443e-04 - val_r_squared: 0.9807 - lr:
1.0000e-05
Epoch 160/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.0971 - val_loss: 2.2237e-05 - val_r_squared: 0.9952 - lr:
1.0000e-05
Epoch 161/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0036 -
r_squared: 0.1152 - val_loss: 9.9376e-05 - val_r_squared: 0.9781 - lr:
1.0000e-05
Epoch 162/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0039 -
r_squared: -0.0332 - val_loss: 6.9175e-06 - val_r_squared: 0.9983 - lr:
1.0000e-05
Epoch 163/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0039 -
r_squared: 0.1021 - val_loss: 1.6974e-05 - val_r_squared: 0.9966 - lr:
1.0000e-05
Epoch 164/1000
```

```
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.0630 - val_loss: 1.3742e-05 - val_r_squared: 0.9976 - lr:
1.0000e-05
Epoch 165/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0040 -
r_squared: 0.0579 - val_loss: 2.0265e-05 - val_r_squared: 0.9966 - lr:
1.0000e-05
Epoch 166/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.1750 - val_loss: 5.2931e-05 - val_r_squared: 0.9896 - lr:
1.0000e-05
Epoch 167/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.0888 - val_loss: 1.5347e-05 - val_r_squared: 0.9974 - lr:
1.0000e-05
Epoch 168/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.2077 - val_loss: 9.1233e-06 - val_r_squared: 0.9985 - lr:
1.0000e-05
Epoch 169/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: 0.0435 - val_loss: 5.8523e-06 - val_r_squared: 0.9990 - lr:
1.0000e-05
Epoch 170/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: -0.1174 - val_loss: 2.8304e-05 - val_r_squared: 0.9949 - lr:
1.0000e-05
Epoch 171/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0170 - val_loss: 5.0824e-05 - val_r_squared: 0.9908 - lr:
1.0000e-05
Epoch 172/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: 0.0465 - val_loss: 4.5036e-05 - val_r_squared: 0.9920 - lr:
1.0000e-05
Epoch 173/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0033 -
r_squared: 0.2545 - val_loss: 2.6696e-05 - val_r_squared: 0.9941 - lr:
1.0000e-05
Epoch 174/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: -0.0728 - val_loss: 1.5352e-05 - val_r_squared: 0.9974 - lr:
1.0000e-05
Epoch 175/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0056 -
r_squared: -0.4277 - val_loss: 4.4405e-05 - val_r_squared: 0.9921 - lr:
1.0000e-05
Epoch 176/1000
```

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13/13 [==============================] - 0s 23ms/step - loss: 0.0052 -
r_squared: -0.1405 - val_loss: 3.9805e-05 - val_r_squared: 0.9921 - lr:
1.0000e-05
Epoch 177/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0046 -
r_squared: -0.0401 - val_loss: 1.1016e-04 - val_r_squared: 0.9797 - lr:
1.0000e-05
Epoch 178/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.0353 - val_loss: 1.0323e-05 - val_r_squared: 0.9980 - lr:
1.0000e-05
Epoch 179/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0057 -
r_squared: -0.2591 - val_loss: 2.6126e-05 - val_r_squared: 0.9956 - lr:
1.0000e-05
Epoch 180/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: -0.2991 - val_loss: 1.1852e-04 - val_r_squared: 0.9780 - lr:
1.0000e-05
Epoch 181/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0052 -
r_squared: -0.3397 - val_loss: 6.0841e-05 - val_r_squared: 0.9878 - lr:
1.0000e-05
Epoch 182/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0051 -
r_squared: -0.4562 - val_loss: 1.9250e-04 - val_r_squared: 0.9616 - lr:
1.0000e-05
Epoch 183/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0061 -
r_squared: -0.3908 - val_loss: 6.2925e-06 - val_r_squared: 0.9989 - lr:
1.0000e-05
Epoch 184/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0054 -
r_squared: -0.3394 - val_loss: 1.7380e-04 - val_r_squared: 0.9680 - lr:
1.0000e-05
Epoch 185/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0992 - val_loss: 2.3499e-05 - val_r_squared: 0.9960 - lr:
1.0000e-05
Epoch 186/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0047 -
r_squared: -0.2472 - val_loss: 6.0374e-05 - val_r_squared: 0.9889 - lr:
1.0000e-05
Epoch 187/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0056 -
r_squared: -0.3450 - val_loss: 1.5045e-04 - val_r_squared: 0.9705 - lr:
1.0000e-05
Epoch 188/1000
```

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13/13 [==============================] - 0s 24ms/step - loss: 0.0041 -
r_squared: 0.1229 - val_loss: 1.3460e-05 - val_r_squared: 0.9976 - lr:
1.0000e-05
Epoch 189/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0039 -
r_squared: 0.0801 - val_loss: 6.0275e-05 - val_r_squared: 0.9891 - lr:
1.0000e-05
Epoch 190/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0051 -
r_squared: -0.2693 - val_loss: 1.3291e-04 - val_r_squared: 0.9768 - lr:
1.0000e-05
Epoch 191/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0045 -
r_squared: -0.2362 - val_loss: 4.0971e-05 - val_r_squared: 0.9914 - lr:
1.0000e-05
Epoch 192/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0580 - val_loss: 8.7742e-05 - val_r_squared: 0.9795 - lr:
1.0000e-05
Epoch 193/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0052 -
r_squared: -0.2313 - val_loss: 2.1789e-05 - val_r_squared: 0.9956 - lr:
1.0000e-05
Epoch 194/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0045 -
r_squared: -0.0855 - val_loss: 5.2075e-05 - val_r_squared: 0.9911 - lr:
1.0000e-05
Epoch 195/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0050 -
r_squared: -0.2048 - val_loss: 3.5794e-06 - val_r_squared: 0.9993 - lr:
1.0000e-05
Epoch 196/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.1700 - val_loss: 7.2688e-05 - val_r_squared: 0.9862 - lr:
1.0000e-05
Epoch 197/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0046 -
r_squared: -0.0326 - val_loss: 3.1452e-05 - val_r_squared: 0.9943 - lr:
1.0000e-05
Epoch 198/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0051 -
r_squared: -0.0966 - val_loss: 1.3572e-04 - val_r_squared: 0.9723 - lr:
1.0000e-05
Epoch 199/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0044 -
r_squared: -0.0555 - val_loss: 6.9882e-05 - val_r_squared: 0.9870 - lr:
1.0000e-05
Epoch 200/1000
```

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13/13 [==============================] - 0s 25ms/step - loss: 0.0042 -
r_squared: 0.0554 - val_loss: 7.6045e-05 - val_r_squared: 0.9837 - lr:
1.0000e-05
Epoch 201/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0047 -
r_squared: -0.1947 - val_loss: 1.1798e-05 - val_r_squared: 0.9978 - lr:
1.0000e-05
Epoch 202/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0049 -
r_squared: -0.2097 - val_loss: 1.6111e-05 - val_r_squared: 0.9970 - lr:
1.0000e-05
Epoch 203/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0054 -
r_squared: -0.2071 - val_loss: 3.1025e-05 - val_r_squared: 0.9947 - lr:
1.0000e-05
Epoch 204/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0038 -
r_squared: 0.1385 - val_loss: 2.3156e-05 - val_r_squared: 0.9960 - lr:
1.0000e-05
Epoch 205/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: 0.0424 - val_loss: 1.0391e-05 - val_r_squared: 0.9982 - lr:
1.0000e-05
Epoch 206/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.0037 - val_loss: 4.4111e-05 - val_r_squared: 0.9922 - lr:
1.0000e-05
Epoch 207/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0040 -
r_squared: 0.0137 - val_loss: 1.5755e-05 - val_r_squared: 0.9974 - lr:
1.0000e-05
Epoch 208/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.1198 - val_loss: 6.7883e-06 - val_r_squared: 0.9983 - lr:
1.0000e-05
Epoch 209/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0049 -
r_squared: -0.1588 - val_loss: 2.0803e-05 - val_r_squared: 0.9961 - lr:
1.0000e-05
Epoch 210/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0053 -
r_squared: -0.3122 - val_loss: 5.5645e-05 - val_r_squared: 0.9887 - lr:
1.0000e-05
Epoch 211/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0056 -
r_squared: -0.2850 - val_loss: 5.1836e-05 - val_r_squared: 0.9895 - lr:
1.0000e-05
Epoch 212/1000
```

```
13/13 [==============================] - 0s 21ms/step - loss: 0.0045 -
r_squared: -0.1110 - val_loss: 1.2393e-04 - val_r_squared: 0.9750 - lr:
1.0000e-05
Epoch 213/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0040 -
r_squared: -0.2042 - val_loss: 3.2319e-05 - val_r_squared: 0.9938 - lr:
1.0000e-05
Epoch 214/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0041 -
r_squared: 0.0789 - val_loss: 2.2133e-05 - val_r_squared: 0.9963 - lr:
1.0000e-05
Epoch 215/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0053 -
r_squared: -0.2218 - val_loss: 2.3885e-05 - val_r_squared: 0.9960 - lr:
1.0000e-05
Epoch 216/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0049 -
r_squared: -0.2112 - val_loss: 2.6761e-05 - val_r_squared: 0.9953 - lr:
1.0000e-05
Epoch 217/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0026 - val_loss: 1.0685e-05 - val_r_squared: 0.9976 - lr:
1.0000e-05
Epoch 218/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0041 -
r_squared: 0.0944 - val_loss: 3.2911e-05 - val_r_squared: 0.9942 - lr:
1.0000e-05
Epoch 219/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.0651 - val_loss: 2.5930e-05 - val_r_squared: 0.9957 - lr:
1.0000e-05
Epoch 220/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: 0.0306 - val_loss: 1.3614e-04 - val_r_squared: 0.9745 - lr:
1.0000e-05
Epoch 221/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0043 -
r_squared: -0.1176 - val_loss: 5.4008e-05 - val_r_squared: 0.9898 - lr:
1.0000e-05
Epoch 222/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0295 - val_loss: 8.6965e-05 - val_r_squared: 0.9832 - lr:
1.0000e-05
Epoch 223/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.1538 - val_loss: 9.4551e-06 - val_r_squared: 0.9979 - lr:
1.0000e-05
Epoch 224/1000
```

```
13/13 [==============================] - 0s 20ms/step - loss: 0.0044 -
r_squared: -0.0992 - val_loss: 5.2675e-05 - val_r_squared: 0.9877 - lr:
1.0000e-05
Epoch 225/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1663 - val_loss: 4.6550e-06 - val_r_squared: 0.9990 - lr:
1.0000e-05
Epoch 226/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.2265 - val_loss: 2.1001e-04 - val_r_squared: 0.9629 - lr:
1.0000e-05
Epoch 227/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.2327 - val_loss: 2.5325e-05 - val_r_squared: 0.9948 - lr:
1.0000e-05
Epoch 228/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.0539 - val_loss: 3.8077e-05 - val_r_squared: 0.9927 - lr:
1.0000e-05
Epoch 229/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0047 -
r_squared: -0.2159 - val_loss: 2.9038e-05 - val_r_squared: 0.9951 - lr:
1.0000e-05
Epoch 230/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0054 -
r_squared: -0.1745 - val_loss: 5.5247e-05 - val_r_squared: 0.9894 - lr:
1.0000e-05
Epoch 231/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: -0.0407 - val_loss: 2.7752e-05 - val_r_squared: 0.9949 - lr:
1.0000e-05
Epoch 232/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.1385 - val_loss: 2.6590e-05 - val_r_squared: 0.9955 - lr:
1.0000e-05
Epoch 233/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: -0.1133 - val_loss: 2.8254e-05 - val_r_squared: 0.9952 - lr:
1.0000e-05
Epoch 234/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.1383 - val_loss: 1.2519e-04 - val_r_squared: 0.9768 - lr:
1.0000e-05
Epoch 235/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0041 -
r_squared: -0.0430 - val_loss: 4.2435e-05 - val_r_squared: 0.9918 - lr:
1.0000e-05
Epoch 236/1000
```

```
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.1582 - val_loss: 3.2161e-05 - val_r_squared: 0.9942 - lr:
1.0000e-05
Epoch 237/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.0868 - val_loss: 4.7870e-05 - val_r_squared: 0.9909 - lr:
1.0000e-05
Epoch 238/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0051 -
r_squared: -0.1331 - val_loss: 6.4074e-05 - val_r_squared: 0.9869 - lr:
1.0000e-05
Epoch 239/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.1407 - val_loss: 7.6532e-05 - val_r_squared: 0.9848 - lr:
1.0000e-05
Epoch 240/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0052 -
r_squared: -0.2072 - val_loss: 4.7492e-05 - val_r_squared: 0.9904 - lr:
1.0000e-05
Epoch 241/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.1127 - val_loss: 7.1100e-05 - val_r_squared: 0.9854 - lr:
1.0000e-05
Epoch 242/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0041 -
r_squared: 0.0338 - val_loss: 4.6604e-05 - val_r_squared: 0.9914 - lr:
1.0000e-05
Epoch 243/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0050 -
r_squared: -0.1283 - val_loss: 4.0052e-05 - val_r_squared: 0.9926 - lr:
1.0000e-05
Epoch 244/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.1397 - val_loss: 1.7414e-05 - val_r_squared: 0.9967 - lr:
1.0000e-05
Epoch 245/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0038 -
r_squared: 0.1466 - val_loss: 1.1234e-05 - val_r_squared: 0.9979 - lr:
1.0000e-05
Epoch 246/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0042 -
r_squared: -0.0538 - val_loss: 1.6744e-04 - val_r_squared: 0.9698 - lr:
1.0000e-05
Epoch 247/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0047 -
r_squared: -0.0640 - val_loss: 1.3713e-04 - val_r_squared: 0.9750 - lr:
1.0000e-05
Epoch 248/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.3175 - val_loss: 2.7968e-05 - val_r_squared: 0.9947 - lr:
1.0000e-05
Epoch 249/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0048 -
r_squared: -0.1024 - val_loss: 1.4715e-05 - val_r_squared: 0.9973 - lr:
1.0000e-05
Epoch 250/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0036 -
r_squared: 0.1726 - val_loss: 1.0265e-05 - val_r_squared: 0.9981 - lr:
1.0000e-05
Epoch 251/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0052 -
r_squared: -0.4392 - val_loss: 3.5166e-05 - val_r_squared: 0.9937 - lr:
1.0000e-05
Epoch 252/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0041 -
r_squared: 0.1075 - val_loss: 2.4504e-05 - val_r_squared: 0.9953 - lr:
1.0000e-05
Epoch 253/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0050 -
r_squared: -0.2952 - val_loss: 8.3726e-05 - val_r_squared: 0.9854 - lr:
1.0000e-05
Epoch 254/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0047 -
r_squared: -0.0768 - val_loss: 4.3446e-05 - val_r_squared: 0.9926 - lr:
1.0000e-05
Epoch 255/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0043 -
r_squared: -0.0824 - val_loss: 3.5361e-05 - val_r_squared: 0.9932 - lr:
1.0000e-05
Epoch 256/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0047 -
r_squared: -0.1635 - val_loss: 1.1828e-04 - val_r_squared: 0.9777 - lr:
1.0000e-05
Epoch 257/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.1337 - val_loss: 4.0942e-05 - val_r_squared: 0.9930 - lr:
1.0000e-05
Epoch 258/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0051 -
r_squared: -0.2566 - val_loss: 6.8190e-05 - val_r_squared: 0.9883 - lr:
1.0000e-05
Epoch 259/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.2718 - val_loss: 1.2399e-04 - val_r_squared: 0.9775 - lr:
1.0000e-05
Epoch 260/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0471 - val_loss: 8.0702e-06 - val_r_squared: 0.9986 - lr:
1.0000e-05
Epoch 261/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.0561 - val_loss: 4.1876e-05 - val_r_squared: 0.9909 - lr:
1.0000e-05
Epoch 262/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.0488 - val_loss: 1.8965e-05 - val_r_squared: 0.9964 - lr:
1.0000e-05
Epoch 263/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0445 - val_loss: 2.6695e-05 - val_r_squared: 0.9949 - lr:
1.0000e-05
Epoch 264/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0045 -
r_squared: -0.3469 - val_loss: 1.5016e-05 - val_r_squared: 0.9973 - lr:
1.0000e-05
Epoch 265/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.1363 - val_loss: 4.6966e-05 - val_r_squared: 0.9911 - lr:
1.0000e-05
Epoch 266/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0039 -
r_squared: 0.0676 - val_loss: 8.5816e-05 - val_r_squared: 0.9840 - lr:
1.0000e-05
Epoch 267/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0653 - val_loss: 7.7968e-05 - val_r_squared: 0.9840 - lr:
1.0000e-05
Epoch 268/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0462 - val_loss: 4.9463e-05 - val_r_squared: 0.9901 - lr:
1.0000e-05
Epoch 269/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.1937 - val_loss: 1.9666e-05 - val_r_squared: 0.9963 - lr:
1.0000e-05
Epoch 270/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.0841 - val_loss: 4.4913e-05 - val_r_squared: 0.9922 - lr:
1.0000e-05
Epoch 271/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0707 - val_loss: 8.2407e-05 - val_r_squared: 0.9859 - lr:
1.0000e-05
Epoch 272/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0053 -
r_squared: -0.4813 - val_loss: 5.8500e-05 - val_r_squared: 0.9862 - lr:
1.0000e-05
Epoch 273/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0039 -
r_squared: 0.1167 - val_loss: 3.1315e-05 - val_r_squared: 0.9924 - lr:
1.0000e-05
Epoch 274/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0039 -
r_squared: 0.1007 - val_loss: 4.2091e-05 - val_r_squared: 0.9928 - lr:
1.0000e-05
Epoch 275/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: -0.0687 - val_loss: 5.0919e-05 - val_r_squared: 0.9908 - lr:
1.0000e-05
Epoch 276/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0050 -
r_squared: -0.1767 - val_loss: 5.2628e-05 - val_r_squared: 0.9876 - lr:
1.0000e-05
Epoch 277/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.1138 - val_loss: 5.4181e-05 - val_r_squared: 0.9885 - lr:
1.0000e-05
Epoch 278/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0051 -
r_squared: -0.2090 - val_loss: 1.7646e-05 - val_r_squared: 0.9964 - lr:
1.0000e-05
Epoch 279/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0049 -
r_squared: -0.1594 - val_loss: 1.9112e-04 - val_r_squared: 0.9635 - lr:
1.0000e-05
Epoch 280/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.2340 - val_loss: 1.9464e-05 - val_r_squared: 0.9964 - lr:
1.0000e-05
Epoch 281/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0049 -
r_squared: -0.1886 - val_loss: 3.4606e-05 - val_r_squared: 0.9924 - lr:
1.0000e-05
Epoch 282/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0037 -
r_squared: 0.2353 - val_loss: 3.4920e-05 - val_r_squared: 0.9931 - lr:
1.0000e-05
Epoch 283/1000
13/13 [==============================] - 0s 28ms/step - loss: 0.0046 -
r_squared: -0.0899 - val_loss: 1.7222e-05 - val_r_squared: 0.9969 - lr:
1.0000e-05
Epoch 284/1000
```

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13/13 [==============================] - 0s 24ms/step - loss: 0.0047 -
r_squared: -0.0928 - val_loss: 2.3726e-05 - val_r_squared: 0.9955 - lr:
1.0000e-05
Epoch 285/1000
13/13 [==============================] - 0s 27ms/step - loss: 0.0046 -
r_squared: -0.1114 - val_loss: 9.5887e-05 - val_r_squared: 0.9802 - lr:
1.0000e-05
Epoch 286/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0053 -
r_squared: -0.4354 - val_loss: 2.3063e-04 - val_r_squared: 0.9515 - lr:
1.0000e-05
Epoch 287/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0052 -
r_squared: -0.1924 - val_loss: 5.9100e-05 - val_r_squared: 0.9882 - lr:
1.0000e-05
Epoch 288/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0052 -
r_squared: -0.3063 - val_loss: 1.2659e-04 - val_r_squared: 0.9741 - lr:
1.0000e-05
Epoch 289/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0037 -
r_squared: 0.1421 - val_loss: 2.1022e-05 - val_r_squared: 0.9961 - lr:
1.0000e-05
Epoch 290/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0045 -
r_squared: -0.2354 - val_loss: 1.3882e-05 - val_r_squared: 0.9975 - lr:
1.0000e-05
Epoch 291/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0052 -
r_squared: -0.3217 - val_loss: 2.0113e-05 - val_r_squared: 0.9962 - lr:
1.0000e-05
Epoch 292/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0040 -
r_squared: 0.0479 - val_loss: 4.0582e-05 - val_r_squared: 0.9928 - lr:
1.0000e-05
Epoch 293/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0046 -
r_squared: -0.1455 - val_loss: 2.7862e-05 - val_r_squared: 0.9946 - lr:
1.0000e-05
Epoch 294/1000
13/13 [==============================] - 0s 27ms/step - loss: 0.0041 -
r_squared: -0.0049 - val_loss: 4.9079e-05 - val_r_squared: 0.9911 - lr:
1.0000e-05
Epoch 295/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0040 -
r_squared: 0.0546 - val_loss: 4.6372e-06 - val_r_squared: 0.9990 - lr:
1.0000e-05
Epoch 296/1000
```

```
13/13 [==============================] - 0s 24ms/step - loss: 0.0048 -
r_squared: -0.0921 - val_loss: 4.4623e-05 - val_r_squared: 0.9910 - lr:
1.0000e-05
Epoch 297/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0051 -
r_squared: -0.3025 - val_loss: 4.8671e-05 - val_r_squared: 0.9913 - lr:
1.0000e-05
Epoch 298/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0039 -
r_squared: 0.0536 - val_loss: 1.7028e-05 - val_r_squared: 0.9969 - lr:
1.0000e-05
Epoch 299/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.0846 - val_loss: 1.3795e-04 - val_r_squared: 0.9740 - lr:
1.0000e-05
Epoch 300/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0052 -
r_squared: -0.2176 - val_loss: 2.2451e-05 - val_r_squared: 0.9959 - lr:
1.0000e-05
Epoch 301/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.2566 - val_loss: 5.3891e-06 - val_r_squared: 0.9990 - lr:
1.0000e-05
Epoch 302/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0041 -
r_squared: 0.0054 - val_loss: 2.6195e-05 - val_r_squared: 0.9956 - lr:
1.0000e-05
Epoch 303/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0036 -
r_squared: 0.1025 - val_loss: 4.0235e-05 - val_r_squared: 0.9916 - lr:
1.0000e-05
Epoch 304/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0046 -
r_squared: -0.0890 - val_loss: 2.2652e-05 - val_r_squared: 0.9957 - lr:
1.0000e-05
Epoch 305/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.2530 - val_loss: 1.7438e-05 - val_r_squared: 0.9970 - lr:
1.0000e-05
Epoch 306/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.0675 - val_loss: 4.3295e-05 - val_r_squared: 0.9920 - lr:
1.0000e-05
Epoch 307/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.0548 - val_loss: 6.4369e-05 - val_r_squared: 0.9869 - lr:
1.0000e-05
Epoch 308/1000
```

```
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.0105 - val_loss: 6.0601e-06 - val_r_squared: 0.9988 - lr:
1.0000e-05
Epoch 309/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0050 -
r_squared: -0.1197 - val_loss: 7.9858e-06 - val_r_squared: 0.9980 - lr:
1.0000e-05
Epoch 310/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.2894 - val_loss: 1.2264e-05 - val_r_squared: 0.9978 - lr:
1.0000e-05
Epoch 311/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0042 -
r_squared: -0.0516 - val_loss: 4.6858e-06 - val_r_squared: 0.9991 - lr:
1.0000e-05
Epoch 312/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0039 -
r_squared: -0.0049 - val_loss: 1.8088e-05 - val_r_squared: 0.9962 - lr:
1.0000e-05
Epoch 313/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0047 -
r_squared: -0.0864 - val_loss: 1.1696e-05 - val_r_squared: 0.9973 - lr:
1.0000e-05
Epoch 314/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0052 -
r_squared: -0.2227 - val_loss: 8.9779e-05 - val_r_squared: 0.9823 - lr:
1.0000e-05
Epoch 315/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.0505 - val_loss: 6.3083e-05 - val_r_squared: 0.9871 - lr:
1.0000e-05
Epoch 316/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0671 - val_loss: 1.9559e-05 - val_r_squared: 0.9959 - lr:
1.0000e-05
Epoch 317/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.2054 - val_loss: 3.8883e-06 - val_r_squared: 0.9992 - lr:
1.0000e-05
Epoch 318/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.0673 - val_loss: 4.1712e-05 - val_r_squared: 0.9900 - lr:
1.0000e-05
Epoch 319/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.2573 - val_loss: 2.1932e-04 - val_r_squared: 0.9512 - lr:
1.0000e-05
Epoch 320/1000
```

```
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.0999 - val_loss: 8.0244e-06 - val_r_squared: 0.9986 - lr:
1.0000e-05
Epoch 321/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0058 -
r_squared: -0.4982 - val_loss: 4.5661e-05 - val_r_squared: 0.9920 - lr:
1.0000e-05
Epoch 322/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.0276 - val_loss: 1.8795e-05 - val_r_squared: 0.9968 - lr:
1.0000e-05
Epoch 323/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.0599 - val_loss: 1.8286e-05 - val_r_squared: 0.9967 - lr:
1.0000e-05
Epoch 324/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.0812 - val_loss: 1.3802e-05 - val_r_squared: 0.9973 - lr:
1.0000e-05
Epoch 325/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0042 -
r_squared: -0.0247 - val_loss: 2.5041e-05 - val_r_squared: 0.9953 - lr:
1.0000e-05
Epoch 326/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0056 -
r_squared: -0.3194 - val_loss: 1.6521e-05 - val_r_squared: 0.9969 - lr:
1.0000e-05
Epoch 327/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0052 -
r_squared: -0.1690 - val_loss: 2.6998e-05 - val_r_squared: 0.9953 - lr:
1.0000e-05
Epoch 328/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.0089 - val_loss: 1.0813e-04 - val_r_squared: 0.9807 - lr:
1.0000e-05
Epoch 329/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.0848 - val_loss: 3.2649e-05 - val_r_squared: 0.9927 - lr:
1.0000e-05
Epoch 330/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.1427 - val_loss: 1.1624e-05 - val_r_squared: 0.9979 - lr:
1.0000e-05
Epoch 331/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.1659 - val_loss: 1.3412e-05 - val_r_squared: 0.9975 - lr:
1.0000e-05
Epoch 332/1000
```

```
13/13 [==============================] - 0s 24ms/step - loss: 0.0051 -
r_squared: -0.3390 - val_loss: 5.5500e-05 - val_r_squared: 0.9895 - lr:
1.0000e-05
Epoch 333/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.0545 - val_loss: 2.9790e-05 - val_r_squared: 0.9941 - lr:
1.0000e-05
Epoch 334/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.0946 - val_loss: 8.4251e-06 - val_r_squared: 0.9985 - lr:
1.0000e-05
Epoch 335/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: -0.0078 - val_loss: 2.6245e-05 - val_r_squared: 0.9952 - lr:
1.0000e-05
Epoch 336/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0040 -
r_squared: -0.0300 - val_loss: 1.1950e-05 - val_r_squared: 0.9980 - lr:
1.0000e-05
Epoch 337/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.1127 - val_loss: 2.4304e-05 - val_r_squared: 0.9944 - lr:
1.0000e-05
Epoch 338/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: 0.0886 - val_loss: 2.9030e-05 - val_r_squared: 0.9935 - lr:
1.0000e-05
Epoch 339/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0034 - val_loss: 6.6974e-05 - val_r_squared: 0.9875 - lr:
1.0000e-05
Epoch 340/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: 0.0197 - val_loss: 1.1739e-05 - val_r_squared: 0.9980 - lr:
1.0000e-05
Epoch 341/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.2893 - val_loss: 6.7909e-06 - val_r_squared: 0.9988 - lr:
1.0000e-05
Epoch 342/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.0771 - val_loss: 2.4204e-05 - val_r_squared: 0.9956 - lr:
1.0000e-05
Epoch 343/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0039 -
r_squared: 0.0617 - val_loss: 5.6112e-05 - val_r_squared: 0.9904 - lr:
1.0000e-05
Epoch 344/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0940 - val_loss: 5.2174e-05 - val_r_squared: 0.9880 - lr:
1.0000e-05
Epoch 345/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0050 -
r_squared: -0.1461 - val_loss: 3.4779e-05 - val_r_squared: 0.9926 - lr:
1.0000e-05
Epoch 346/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0039 -
r_squared: 0.0502 - val_loss: 4.4275e-06 - val_r_squared: 0.9991 - lr:
1.0000e-05
Epoch 347/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0042 -
r_squared: -0.0616 - val_loss: 1.8398e-04 - val_r_squared: 0.9681 - lr:
1.0000e-05
Epoch 348/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.1224 - val_loss: 4.7532e-05 - val_r_squared: 0.9904 - lr:
1.0000e-05
Epoch 349/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.5158 - val_loss: 7.8281e-05 - val_r_squared: 0.9842 - lr:
1.0000e-05
Epoch 350/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.0650 - val_loss: 5.6415e-06 - val_r_squared: 0.9990 - lr:
1.0000e-05
Epoch 351/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0039 -
r_squared: 0.0838 - val_loss: 6.4331e-06 - val_r_squared: 0.9987 - lr:
1.0000e-05
Epoch 352/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0047 -
r_squared: -0.4096 - val_loss: 8.7275e-06 - val_r_squared: 0.9980 - lr:
1.0000e-05
Epoch 353/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0044 -
r_squared: -0.0074 - val_loss: 5.6795e-05 - val_r_squared: 0.9889 - lr:
1.0000e-05
Epoch 354/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0046 -
r_squared: -0.2010 - val_loss: 6.6551e-05 - val_r_squared: 0.9878 - lr:
1.0000e-05
Epoch 355/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0034 -
r_squared: 0.2042 - val_loss: 7.7012e-05 - val_r_squared: 0.9856 - lr:
1.0000e-05
Epoch 356/1000
```

```
13/13 [==============================] - 0s 24ms/step - loss: 0.0037 -
r_squared: 0.1429 - val_loss: 1.0881e-05 - val_r_squared: 0.9979 - lr:
1.0000e-05
Epoch 357/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.2933 - val_loss: 2.9817e-05 - val_r_squared: 0.9948 - lr:
1.0000e-05
Epoch 358/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0046 -
r_squared: -0.0248 - val_loss: 4.0867e-05 - val_r_squared: 0.9930 - lr:
1.0000e-05
Epoch 359/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0051 -
r_squared: -0.2394 - val_loss: 7.9485e-06 - val_r_squared: 0.9986 - lr:
1.0000e-05
Epoch 360/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0040 -
r_squared: -0.0177 - val_loss: 1.4489e-05 - val_r_squared: 0.9969 - lr:
1.0000e-05
Epoch 361/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0048 -
r_squared: -0.0768 - val_loss: 1.0406e-04 - val_r_squared: 0.9821 - lr:
1.0000e-05
Epoch 362/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: 0.0474 - val_loss: 2.7378e-06 - val_r_squared: 0.9993 - lr:
1.0000e-05
Epoch 363/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0053 -
r_squared: -0.2408 - val_loss: 1.7652e-05 - val_r_squared: 0.9967 - lr:
1.0000e-05
Epoch 364/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.1726 - val_loss: 2.6846e-05 - val_r_squared: 0.9954 - lr:
1.0000e-05
Epoch 365/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.1039 - val_loss: 9.7716e-05 - val_r_squared: 0.9805 - lr:
1.0000e-05
Epoch 366/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0043 -
r_squared: -0.0041 - val_loss: 6.7017e-06 - val_r_squared: 0.9988 - lr:
1.0000e-05
Epoch 367/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0045 -
r_squared: -0.0536 - val_loss: 4.1015e-06 - val_r_squared: 0.9990 - lr:
1.0000e-05
Epoch 368/1000
```

```
13/13 [==============================] - 0s 25ms/step - loss: 0.0042 -
r_squared: -0.0659 - val_loss: 9.1951e-06 - val_r_squared: 0.9985 - lr:
1.0000e-05
Epoch 369/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0049 -
r_squared: -0.0835 - val_loss: 3.6014e-05 - val_r_squared: 0.9935 - lr:
1.0000e-05
Epoch 370/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0054 -
r_squared: -0.2609 - val_loss: 5.6506e-05 - val_r_squared: 0.9885 - lr:
1.0000e-05
Epoch 371/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: 0.0115 - val_loss: 3.8521e-05 - val_r_squared: 0.9923 - lr:
1.0000e-05
Epoch 372/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0044 -
r_squared: 0.0743 - val_loss: 1.8076e-05 - val_r_squared: 0.9968 - lr:
1.0000e-05
Epoch 373/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.1738 - val_loss: 5.8554e-05 - val_r_squared: 0.9896 - lr:
1.0000e-05
Epoch 374/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0044 -
r_squared: -0.2066 - val_loss: 4.2791e-05 - val_r_squared: 0.9926 - lr:
1.0000e-05
Epoch 375/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0048 -
r_squared: -0.1208 - val_loss: 3.7765e-05 - val_r_squared: 0.9933 - lr:
1.0000e-05
Epoch 376/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0045 -
r_squared: -0.0518 - val_loss: 5.3043e-05 - val_r_squared: 0.9873 - lr:
1.0000e-05
Epoch 377/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.1286 - val_loss: 1.8930e-04 - val_r_squared: 0.9623 - lr:
1.0000e-05
Epoch 378/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0050 -
r_squared: -0.3211 - val_loss: 5.2790e-05 - val_r_squared: 0.9892 - lr:
1.0000e-05
Epoch 379/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0747 - val_loss: 2.8987e-05 - val_r_squared: 0.9943 - lr:
1.0000e-05
Epoch 380/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0041 -
r_squared: 0.0626 - val_loss: 1.0003e-05 - val_r_squared: 0.9980 - lr:
1.0000e-05
Epoch 381/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: 0.0014 - val_loss: 3.2713e-05 - val_r_squared: 0.9927 - lr:
1.0000e-05
Epoch 382/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.0208 - val_loss: 4.2403e-05 - val_r_squared: 0.9928 - lr:
1.0000e-05
Epoch 383/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0050 -
r_squared: -0.3079 - val_loss: 8.1007e-06 - val_r_squared: 0.9986 - lr:
1.0000e-05
Epoch 384/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0045 -
r_squared: -0.0052 - val_loss: 8.9550e-06 - val_r_squared: 0.9984 - lr:
1.0000e-05
Epoch 385/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0043 -
r_squared: -0.1325 - val_loss: 1.0018e-05 - val_r_squared: 0.9982 - lr:
1.0000e-05
Epoch 386/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0049 -
r_squared: -0.1242 - val_loss: 4.9310e-05 - val_r_squared: 0.9904 - lr:
1.0000e-05
Epoch 387/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0049 -
r_squared: -0.1626 - val_loss: 2.8316e-05 - val_r_squared: 0.9951 - lr:
1.0000e-05
Epoch 388/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0036 -
r_squared: -0.0926 - val_loss: 1.5091e-04 - val_r_squared: 0.9675 - lr:
1.0000e-05
Epoch 389/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0037 -
r_squared: 0.1957 - val_loss: 2.5074e-05 - val_r_squared: 0.9941 - lr:
1.0000e-05
Epoch 390/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0045 -
r_squared: 0.0725 - val_loss: 1.7452e-04 - val_r_squared: 0.9686 - lr:
1.0000e-05
Epoch 391/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0037 -
r_squared: 0.0624 - val_loss: 9.2704e-05 - val_r_squared: 0.9840 - lr:
1.0000e-05
Epoch 392/1000
```

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13/13 [==============================] - 0s 25ms/step - loss: 0.0037 -
r_squared: 0.1795 - val_loss: 1.5906e-05 - val_r_squared: 0.9968 - lr:
1.0000e-05
Epoch 393/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0046 -
r_squared: -0.0024 - val_loss: 6.8640e-06 - val_r_squared: 0.9988 - lr:
1.0000e-05
Epoch 394/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0044 -
r_squared: -0.0208 - val_loss: 3.3298e-05 - val_r_squared: 0.9939 - lr:
1.0000e-05
Epoch 395/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0042 -
r_squared: 0.0753 - val_loss: 6.8462e-05 - val_r_squared: 0.9861 - lr:
1.0000e-05
Epoch 396/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.1228 - val_loss: 1.1613e-05 - val_r_squared: 0.9975 - lr:
1.0000e-05
Epoch 397/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.0945 - val_loss: 1.0194e-05 - val_r_squared: 0.9981 - lr:
1.0000e-05
Epoch 398/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.2912 - val_loss: 5.5670e-05 - val_r_squared: 0.9889 - lr:
1.0000e-05
Epoch 399/1000
13/13 [==============================] - 0s 27ms/step - loss: 0.0039 -
r_squared: 0.1182 - val_loss: 1.8276e-05 - val_r_squared: 0.9965 - lr:
1.0000e-05
Epoch 400/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0052 -
r_squared: -0.2729 - val_loss: 1.5275e-04 - val_r_squared: 0.9681 - lr:
1.0000e-05
Epoch 401/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0044 -
r_squared: 0.0507 - val_loss: 1.0732e-05 - val_r_squared: 0.9980 - lr:
1.0000e-05
Epoch 402/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0046 -
r_squared: -0.5824 - val_loss: 1.0434e-04 - val_r_squared: 0.9816 - lr:
1.0000e-05
Epoch 403/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0050 -
r_squared: -0.1447 - val_loss: 1.2085e-04 - val_r_squared: 0.9785 - lr:
1.0000e-05
Epoch 404/1000
```

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13/13 [==============================] - 0s 23ms/step - loss: 0.0038 -
r_squared: -0.1335 - val_loss: 9.9716e-06 - val_r_squared: 0.9982 - lr:
1.0000e-05
Epoch 405/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.3778 - val_loss: 1.0655e-04 - val_r_squared: 0.9776 - lr:
1.0000e-05
Epoch 406/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: 0.0216 - val_loss: 8.1174e-05 - val_r_squared: 0.9831 - lr:
1.0000e-05
Epoch 407/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0040 -
r_squared: 0.1189 - val_loss: 1.7014e-04 - val_r_squared: 0.9657 - lr:
1.0000e-05
Epoch 408/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: -0.3005 - val_loss: 1.0085e-04 - val_r_squared: 0.9811 - lr:
1.0000e-05
Epoch 409/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0047 -
r_squared: -0.1493 - val_loss: 1.6620e-05 - val_r_squared: 0.9971 - lr:
1.0000e-05
Epoch 410/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.1790 - val_loss: 4.2108e-05 - val_r_squared: 0.9915 - lr:
1.0000e-05
Epoch 411/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0051 -
r_squared: -0.2058 - val_loss: 2.0830e-05 - val_r_squared: 0.9960 - lr:
1.0000e-05
Epoch 412/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.0494 - val_loss: 6.3662e-05 - val_r_squared: 0.9870 - lr:
1.0000e-05
Epoch 413/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.0700 - val_loss: 4.6654e-05 - val_r_squared: 0.9911 - lr:
1.0000e-05
Epoch 414/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.0440 - val_loss: 3.6825e-06 - val_r_squared: 0.9993 - lr:
1.0000e-05
Epoch 415/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: 0.0291 - val_loss: 4.2078e-06 - val_r_squared: 0.9993 - lr:
1.0000e-05
Epoch 416/1000
```

```
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.0676 - val_loss: 8.2123e-05 - val_r_squared: 0.9840 - lr:
1.0000e-05
Epoch 417/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.0856 - val_loss: 1.3206e-05 - val_r_squared: 0.9976 - lr:
1.0000e-05
Epoch 418/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0043 -
r_squared: -0.1740 - val_loss: 5.3575e-05 - val_r_squared: 0.9874 - lr:
1.0000e-05
Epoch 419/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.1826 - val_loss: 4.7118e-06 - val_r_squared: 0.9988 - lr:
1.0000e-05
Epoch 420/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0039 -
r_squared: 0.1096 - val_loss: 1.1770e-05 - val_r_squared: 0.9979 - lr:
1.0000e-05
Epoch 421/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.0788 - val_loss: 7.1285e-05 - val_r_squared: 0.9863 - lr:
1.0000e-05
Epoch 422/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.1221 - val_loss: 2.9898e-05 - val_r_squared: 0.9927 - lr:
1.0000e-05
Epoch 423/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0042 -
r_squared: 0.0222 - val_loss: 9.3656e-05 - val_r_squared: 0.9837 - lr:
1.0000e-05
Epoch 424/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.1371 - val_loss: 3.3015e-05 - val_r_squared: 0.9944 - lr:
1.0000e-05
Epoch 425/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.0958 - val_loss: 2.5705e-05 - val_r_squared: 0.9954 - lr:
1.0000e-05
Epoch 426/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0049 -
r_squared: -0.1463 - val_loss: 4.9341e-05 - val_r_squared: 0.9901 - lr:
1.0000e-05
Epoch 427/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0046 -
r_squared: -0.0110 - val_loss: 3.3280e-05 - val_r_squared: 0.9936 - lr:
1.0000e-05
Epoch 428/1000
```

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13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.1369 - val_loss: 6.1220e-06 - val_r_squared: 0.9989 - lr:
1.0000e-05
Epoch 429/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0135 - val_loss: 3.7102e-05 - val_r_squared: 0.9916 - lr:
1.0000e-05
Epoch 430/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.0674 - val_loss: 3.0844e-05 - val_r_squared: 0.9924 - lr:
1.0000e-05
Epoch 431/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0046 -
r_squared: -0.0536 - val_loss: 5.6015e-05 - val_r_squared: 0.9904 - lr:
1.0000e-05
Epoch 432/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0041 -
r_squared: 0.0505 - val_loss: 8.4316e-06 - val_r_squared: 0.9985 - lr:
1.0000e-05
Epoch 433/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0045 -
r_squared: -0.0340 - val_loss: 3.3375e-05 - val_r_squared: 0.9936 - lr:
1.0000e-05
Epoch 434/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0043 -
r_squared: 0.0109 - val_loss: 1.9698e-05 - val_r_squared: 0.9967 - lr:
1.0000e-05
Epoch 435/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.0981 - val_loss: 2.3242e-05 - val_r_squared: 0.9952 - lr:
1.0000e-05
Epoch 436/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0365 - val_loss: 7.6870e-05 - val_r_squared: 0.9849 - lr:
1.0000e-05
Epoch 437/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.0584 - val_loss: 6.4592e-05 - val_r_squared: 0.9890 - lr:
1.0000e-05
Epoch 438/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.3189 - val_loss: 1.2048e-05 - val_r_squared: 0.9974 - lr:
1.0000e-05
Epoch 439/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: 0.1251 - val_loss: 7.0990e-06 - val_r_squared: 0.9988 - lr:
1.0000e-05
Epoch 440/1000
```

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13/13 [==============================] - 0s 21ms/step - loss: 0.0037 -
r_squared: 0.1076 - val_loss: 8.2798e-06 - val_r_squared: 0.9978 - lr:
1.0000e-05
Epoch 441/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0050 -
r_squared: -0.1824 - val_loss: 1.3637e-05 - val_r_squared: 0.9972 - lr:
1.0000e-05
Epoch 442/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.0327 - val_loss: 5.6609e-05 - val_r_squared: 0.9885 - lr:
1.0000e-05
Epoch 443/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0773 - val_loss: 8.2599e-05 - val_r_squared: 0.9829 - lr:
1.0000e-05
Epoch 444/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.1095 - val_loss: 4.2867e-05 - val_r_squared: 0.9915 - lr:
1.0000e-05
Epoch 445/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.2007 - val_loss: 1.3047e-05 - val_r_squared: 0.9977 - lr:
1.0000e-05
Epoch 446/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0060 -
r_squared: -0.4450 - val_loss: 3.7923e-05 - val_r_squared: 0.9932 - lr:
1.0000e-05
Epoch 447/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0038 -
r_squared: 0.1132 - val_loss: 3.4969e-05 - val_r_squared: 0.9918 - lr:
1.0000e-05
Epoch 448/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.1226 - val_loss: 2.3074e-05 - val_r_squared: 0.9943 - lr:
1.0000e-05
Epoch 449/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0547 - val_loss: 6.8291e-06 - val_r_squared: 0.9987 - lr:
1.0000e-05
Epoch 450/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: -0.6761 - val_loss: 2.0793e-05 - val_r_squared: 0.9960 - lr:
1.0000e-05
Epoch 451/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0036 -
r_squared: 0.1535 - val_loss: 1.5197e-05 - val_r_squared: 0.9972 - lr:
1.0000e-05
Epoch 452/1000
```

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13/13 [==============================] - 0s 23ms/step - loss: 0.0039 -
r_squared: 0.0492 - val_loss: 1.3917e-05 - val_r_squared: 0.9968 - lr:
1.0000e-05
Epoch 453/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.1438 - val_loss: 1.8777e-05 - val_r_squared: 0.9952 - lr:
1.0000e-05
Epoch 454/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.1189 - val_loss: 4.6645e-05 - val_r_squared: 0.9914 - lr:
1.0000e-05
Epoch 455/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.1994 - val_loss: 1.6715e-04 - val_r_squared: 0.9660 - lr:
1.0000e-05
Epoch 456/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.1078 - val_loss: 1.0111e-05 - val_r_squared: 0.9982 - lr:
1.0000e-05
Epoch 457/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0349 - val_loss: 1.2842e-05 - val_r_squared: 0.9977 - lr:
1.0000e-05
Epoch 458/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.1121 - val_loss: 2.7507e-05 - val_r_squared: 0.9937 - lr:
1.0000e-05
Epoch 459/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.2039 - val_loss: 2.5240e-05 - val_r_squared: 0.9943 - lr:
1.0000e-05
Epoch 460/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0536 - val_loss: 2.0197e-05 - val_r_squared: 0.9953 - lr:
1.0000e-05
Epoch 461/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0048 -
r_squared: -0.1763 - val_loss: 1.7734e-05 - val_r_squared: 0.9968 - lr:
1.0000e-05
Epoch 462/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.1017 - val_loss: 1.8666e-04 - val_r_squared: 0.9595 - lr:
1.0000e-05
Epoch 463/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.0675 - val_loss: 2.6381e-05 - val_r_squared: 0.9946 - lr:
1.0000e-05
Epoch 464/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0183 - val_loss: 3.4180e-05 - val_r_squared: 0.9918 - lr:
1.0000e-05
Epoch 465/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0056 -
r_squared: -0.3290 - val_loss: 4.9285e-05 - val_r_squared: 0.9909 - lr:
1.0000e-05
Epoch 466/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0044 -
r_squared: -0.1946 - val_loss: 1.0256e-05 - val_r_squared: 0.9979 - lr:
1.0000e-05
Epoch 467/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.0058 - val_loss: 1.2958e-05 - val_r_squared: 0.9970 - lr:
1.0000e-05
Epoch 468/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.0696 - val_loss: 2.4907e-05 - val_r_squared: 0.9943 - lr:
1.0000e-05
Epoch 469/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0047 -
r_squared: -0.1686 - val_loss: 1.2936e-05 - val_r_squared: 0.9974 - lr:
1.0000e-05
Epoch 470/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1203 - val_loss: 4.6495e-05 - val_r_squared: 0.9893 - lr:
1.0000e-05
Epoch 471/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.1259 - val_loss: 2.7004e-05 - val_r_squared: 0.9950 - lr:
1.0000e-05
Epoch 472/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0225 - val_loss: 1.0187e-05 - val_r_squared: 0.9982 - lr:
1.0000e-05
Epoch 473/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0044 -
r_squared: 0.0466 - val_loss: 1.3655e-04 - val_r_squared: 0.9752 - lr:
1.0000e-05
Epoch 474/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.2002 - val_loss: 2.4953e-05 - val_r_squared: 0.9957 - lr:
1.0000e-05
Epoch 475/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0040 -
r_squared: 0.0833 - val_loss: 2.8858e-05 - val_r_squared: 0.9929 - lr:
1.0000e-05
Epoch 476/1000
```

```
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.0586 - val_loss: 1.6035e-05 - val_r_squared: 0.9965 - lr:
1.0000e-05
Epoch 477/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.0888 - val_loss: 4.7203e-06 - val_r_squared: 0.9991 - lr:
1.0000e-05
Epoch 478/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0046 -
r_squared: -0.1476 - val_loss: 5.1330e-05 - val_r_squared: 0.9907 - lr:
1.0000e-05
Epoch 479/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0051 -
r_squared: -0.1867 - val_loss: 7.6801e-06 - val_r_squared: 0.9986 - lr:
1.0000e-05
Epoch 480/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.1596 - val_loss: 1.1172e-04 - val_r_squared: 0.9775 - lr:
1.0000e-05
Epoch 481/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0054 -
r_squared: -0.3446 - val_loss: 3.5148e-05 - val_r_squared: 0.9934 - lr:
1.0000e-05
Epoch 482/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: -0.0172 - val_loss: 2.0151e-05 - val_r_squared: 0.9963 - lr:
1.0000e-05
Epoch 483/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0042 -
r_squared: -0.0053 - val_loss: 3.0214e-05 - val_r_squared: 0.9926 - lr:
1.0000e-05
Epoch 484/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0048 -
r_squared: -0.1320 - val_loss: 2.3633e-05 - val_r_squared: 0.9956 - lr:
1.0000e-05
Epoch 485/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: 0.0490 - val_loss: 3.6024e-06 - val_r_squared: 0.9991 - lr:
1.0000e-05
Epoch 486/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.0020 - val_loss: 2.3394e-05 - val_r_squared: 0.9941 - lr:
1.0000e-05
Epoch 487/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.0826 - val_loss: 1.7609e-04 - val_r_squared: 0.9597 - lr:
1.0000e-05
Epoch 488/1000
```

```
13/13 [==============================] - 0s 21ms/step - loss: 0.0045 -
r_squared: -0.0478 - val_loss: 4.9120e-05 - val_r_squared: 0.9915 - lr:
1.0000e-05
Epoch 489/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0043 -
r_squared: -0.0529 - val_loss: 1.0179e-04 - val_r_squared: 0.9813 - lr:
1.0000e-05
Epoch 490/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0051 -
r_squared: -0.1822 - val_loss: 6.5902e-05 - val_r_squared: 0.9867 - lr:
1.0000e-05
Epoch 491/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.2534 - val_loss: 4.1112e-05 - val_r_squared: 0.9926 - lr:
1.0000e-05
Epoch 492/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0037 -
r_squared: 0.1663 - val_loss: 5.3044e-05 - val_r_squared: 0.9895 - lr:
1.0000e-05
Epoch 493/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0052 -
r_squared: -0.2072 - val_loss: 8.5480e-06 - val_r_squared: 0.9980 - lr:
1.0000e-05
Epoch 494/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0187 - val_loss: 5.4838e-05 - val_r_squared: 0.9906 - lr:
1.0000e-05
Epoch 495/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.1618 - val_loss: 6.2917e-05 - val_r_squared: 0.9892 - lr:
1.0000e-05
Epoch 496/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0041 -
r_squared: 0.0365 - val_loss: 1.4328e-05 - val_r_squared: 0.9964 - lr:
1.0000e-05
Epoch 497/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.1203 - val_loss: 7.0783e-05 - val_r_squared: 0.9877 - lr:
1.0000e-05
Epoch 498/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.1306 - val_loss: 1.0359e-05 - val_r_squared: 0.9980 - lr:
1.0000e-05
Epoch 499/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0059 -
r_squared: -0.3969 - val_loss: 4.2055e-05 - val_r_squared: 0.9916 - lr:
1.0000e-05
Epoch 500/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.2363 - val_loss: 6.3032e-05 - val_r_squared: 0.9872 - lr:
1.0000e-05
Epoch 501/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0051 -
r_squared: -0.2515 - val_loss: 7.9593e-05 - val_r_squared: 0.9831 - lr:
1.0000e-05
Epoch 502/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: 0.0055 - val_loss: 7.0962e-06 - val_r_squared: 0.9984 - lr:
1.0000e-05
Epoch 503/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0038 -
r_squared: 0.0707 - val_loss: 1.8895e-05 - val_r_squared: 0.9952 - lr:
1.0000e-05
Epoch 504/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0054 -
r_squared: -0.2157 - val_loss: 5.3318e-05 - val_r_squared: 0.9909 - lr:
1.0000e-05
Epoch 505/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0370 - val_loss: 1.1972e-05 - val_r_squared: 0.9979 - lr:
1.0000e-05
Epoch 506/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0042 -
r_squared: 0.0374 - val_loss: 1.2483e-05 - val_r_squared: 0.9978 - lr:
1.0000e-05
Epoch 507/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0040 -
r_squared: -0.0063 - val_loss: 1.8104e-05 - val_r_squared: 0.9968 - lr:
1.0000e-05
Epoch 508/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.0632 - val_loss: 9.1110e-06 - val_r_squared: 0.9985 - lr:
1.0000e-05
Epoch 509/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0053 -
r_squared: -0.2105 - val_loss: 3.9775e-05 - val_r_squared: 0.9931 - lr:
1.0000e-05
Epoch 510/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.0139 - val_loss: 6.0066e-06 - val_r_squared: 0.9984 - lr:
1.0000e-05
Epoch 511/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0051 -
r_squared: -0.1066 - val_loss: 1.1075e-04 - val_r_squared: 0.9742 - lr:
1.0000e-05
Epoch 512/1000
```

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13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: 0.0288 - val_loss: 7.8198e-06 - val_r_squared: 0.9981 - lr:
1.0000e-05
Epoch 513/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0910 - val_loss: 1.2764e-05 - val_r_squared: 0.9977 - lr:
1.0000e-05
Epoch 514/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0044 -
r_squared: 0.0446 - val_loss: 1.0139e-04 - val_r_squared: 0.9795 - lr:
1.0000e-05
Epoch 515/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.1896 - val_loss: 1.0987e-04 - val_r_squared: 0.9773 - lr:
1.0000e-05
Epoch 516/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0053 -
r_squared: -0.2459 - val_loss: 5.2649e-05 - val_r_squared: 0.9898 - lr:
1.0000e-05
Epoch 517/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.1683 - val_loss: 2.3675e-05 - val_r_squared: 0.9955 - lr:
1.0000e-05
Epoch 518/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1221 - val_loss: 5.3378e-05 - val_r_squared: 0.9905 - lr:
1.0000e-05
Epoch 519/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0044 -
r_squared: -0.1730 - val_loss: 1.7837e-05 - val_r_squared: 0.9955 - lr:
1.0000e-05
Epoch 520/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.3671 - val_loss: 7.9620e-05 - val_r_squared: 0.9825 - lr:
1.0000e-05
Epoch 521/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.0158 - val_loss: 6.0066e-05 - val_r_squared: 0.9890 - lr:
1.0000e-05
Epoch 522/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0038 -
r_squared: -0.0206 - val_loss: 2.4970e-04 - val_r_squared: 0.9544 - lr:
1.0000e-05
Epoch 523/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1697 - val_loss: 6.2195e-05 - val_r_squared: 0.9881 - lr:
1.0000e-05
Epoch 524/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.0622 - val_loss: 8.4938e-05 - val_r_squared: 0.9830 - lr:
1.0000e-05
Epoch 525/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.0772 - val_loss: 3.0516e-05 - val_r_squared: 0.9933 - lr:
1.0000e-05
Epoch 526/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.2593 - val_loss: 1.8012e-05 - val_r_squared: 0.9966 - lr:
1.0000e-05
Epoch 527/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.1795 - val_loss: 1.5736e-05 - val_r_squared: 0.9971 - lr:
1.0000e-05
Epoch 528/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0040 -
r_squared: 0.0590 - val_loss: 2.2191e-05 - val_r_squared: 0.9944 - lr:
1.0000e-05
Epoch 529/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: 6.1722e-04 - val_loss: 6.1868e-05 - val_r_squared: 0.9853 - lr:
1.0000e-05
Epoch 530/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0043 -
r_squared: 0.1042 - val_loss: 4.3056e-05 - val_r_squared: 0.9924 - lr:
1.0000e-05
Epoch 531/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0038 -
r_squared: 0.0191 - val_loss: 1.2107e-04 - val_r_squared: 0.9771 - lr:
1.0000e-05
Epoch 532/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: -0.0032 - val_loss: 2.1721e-05 - val_r_squared: 0.9945 - lr:
1.0000e-05
Epoch 533/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.1117 - val_loss: 1.4764e-05 - val_r_squared: 0.9962 - lr:
1.0000e-05
Epoch 534/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: 0.0303 - val_loss: 3.0778e-05 - val_r_squared: 0.9943 - lr:
1.0000e-05
Epoch 535/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.0271 - val_loss: 3.7014e-05 - val_r_squared: 0.9926 - lr:
1.0000e-05
Epoch 536/1000
```

```
13/13 [==============================] - 0s 21ms/step - loss: 0.0042 -
r_squared: 0.0277 - val_loss: 1.6841e-05 - val_r_squared: 0.9960 - lr:
1.0000e-05
Epoch 537/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: 0.0175 - val_loss: 2.0908e-05 - val_r_squared: 0.9964 - lr:
1.0000e-05
Epoch 538/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0041 -
r_squared: 0.0642 - val_loss: 6.4123e-05 - val_r_squared: 0.9879 - lr:
1.0000e-05
Epoch 539/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.2758 - val_loss: 4.2394e-05 - val_r_squared: 0.9911 - lr:
1.0000e-05
Epoch 540/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0051 -
r_squared: -0.2554 - val_loss: 7.0311e-06 - val_r_squared: 0.9982 - lr:
1.0000e-05
Epoch 541/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0039 -
r_squared: 0.0237 - val_loss: 1.4360e-05 - val_r_squared: 0.9975 - lr:
1.0000e-05
Epoch 542/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.1812 - val_loss: 4.1372e-05 - val_r_squared: 0.9929 - lr:
1.0000e-05
Epoch 543/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.6522 - val_loss: 6.0070e-06 - val_r_squared: 0.9988 - lr:
1.0000e-05
Epoch 544/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: 0.0492 - val_loss: 8.7544e-06 - val_r_squared: 0.9983 - lr:
1.0000e-05
Epoch 545/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0055 -
r_squared: -0.2743 - val_loss: 2.5185e-05 - val_r_squared: 0.9957 - lr:
1.0000e-05
Epoch 546/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.1836 - val_loss: 5.2481e-05 - val_r_squared: 0.9910 - lr:
1.0000e-05
Epoch 547/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0052 -
r_squared: -0.2270 - val_loss: 3.3072e-05 - val_r_squared: 0.9940 - lr:
1.0000e-05
Epoch 548/1000
```

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13/13 [==============================] - 0s 21ms/step - loss: 0.0040 -
r_squared: 2.5868e-04 - val_loss: 1.3018e-04 - val_r_squared: 0.9701 - lr:
1.0000e-05
Epoch 549/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0052 -
r_squared: -0.1697 - val_loss: 1.6038e-05 - val_r_squared: 0.9961 - lr:
1.0000e-05
Epoch 550/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.0265 - val_loss: 3.8852e-05 - val_r_squared: 0.9915 - lr:
1.0000e-05
Epoch 551/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0041 -
r_squared: 0.1167 - val_loss: 5.0874e-05 - val_r_squared: 0.9882 - lr:
1.0000e-05
Epoch 552/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0042 -
r_squared: 0.0652 - val_loss: 8.3209e-06 - val_r_squared: 0.9982 - lr:
1.0000e-05
Epoch 553/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0046 -
r_squared: -0.1504 - val_loss: 1.3134e-05 - val_r_squared: 0.9973 - lr:
1.0000e-05
Epoch 554/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0039 -
r_squared: 0.1707 - val_loss: 2.9480e-05 - val_r_squared: 0.9943 - lr:
1.0000e-05
Epoch 555/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0040 -
r_squared: 0.0770 - val_loss: 3.2010e-05 - val_r_squared: 0.9943 - lr:
1.0000e-05
Epoch 556/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.2335 - val_loss: 6.3597e-05 - val_r_squared: 0.9889 - lr:
1.0000e-05
Epoch 557/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.0616 - val_loss: 5.9862e-05 - val_r_squared: 0.9894 - lr:
1.0000e-05
Epoch 558/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.0845 - val_loss: 1.7836e-05 - val_r_squared: 0.9967 - lr:
1.0000e-05
Epoch 559/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.0361 - val_loss: 5.9123e-06 - val_r_squared: 0.9990 - lr:
1.0000e-05
Epoch 560/1000
```

```
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.1125 - val_loss: 3.8852e-06 - val_r_squared: 0.9993 - lr:
1.0000e-05
Epoch 561/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.0712 - val_loss: 2.2950e-05 - val_r_squared: 0.9943 - lr:
1.0000e-05
Epoch 562/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0332 - val_loss: 1.0708e-04 - val_r_squared: 0.9755 - lr:
1.0000e-05
Epoch 563/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.0365 - val_loss: 6.8885e-06 - val_r_squared: 0.9985 - lr:
1.0000e-05
Epoch 564/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0051 -
r_squared: -0.1352 - val_loss: 2.7024e-05 - val_r_squared: 0.9952 - lr:
1.0000e-05
Epoch 565/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0036 -
r_squared: 0.0808 - val_loss: 8.5983e-06 - val_r_squared: 0.9984 - lr:
1.0000e-05
Epoch 566/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0039 -
r_squared: 0.0674 - val_loss: 1.1482e-04 - val_r_squared: 0.9771 - lr:
1.0000e-05
Epoch 567/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0646 - val_loss: 6.8714e-05 - val_r_squared: 0.9876 - lr:
1.0000e-05
Epoch 568/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0044 -
r_squared: -0.0367 - val_loss: 3.7965e-05 - val_r_squared: 0.9936 - lr:
1.0000e-05
Epoch 569/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0044 -
r_squared: -0.1693 - val_loss: 1.2354e-05 - val_r_squared: 0.9975 - lr:
1.0000e-05
Epoch 570/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1480 - val_loss: 7.6198e-06 - val_r_squared: 0.9987 - lr:
1.0000e-05
Epoch 571/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.0613 - val_loss: 1.7744e-05 - val_r_squared: 0.9969 - lr:
1.0000e-05
Epoch 572/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.1383 - val_loss: 4.2082e-06 - val_r_squared: 0.9991 - lr:
1.0000e-05
Epoch 573/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0047 -
r_squared: -0.2751 - val_loss: 3.4713e-05 - val_r_squared: 0.9938 - lr:
1.0000e-05
Epoch 574/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.0537 - val_loss: 1.5110e-04 - val_r_squared: 0.9710 - lr:
1.0000e-05
Epoch 575/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.1617 - val_loss: 3.1473e-05 - val_r_squared: 0.9943 - lr:
1.0000e-05
Epoch 576/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.0555 - val_loss: 2.0700e-05 - val_r_squared: 0.9962 - lr:
1.0000e-05
Epoch 577/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0040 -
r_squared: -0.0488 - val_loss: 1.6060e-05 - val_r_squared: 0.9970 - lr:
1.0000e-05
Epoch 578/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0040 -
r_squared: 0.0500 - val_loss: 4.1210e-05 - val_r_squared: 0.9923 - lr:
1.0000e-05
Epoch 579/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.0719 - val_loss: 7.0538e-05 - val_r_squared: 0.9868 - lr:
1.0000e-05
Epoch 580/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0055 -
r_squared: -0.3800 - val_loss: 7.0650e-05 - val_r_squared: 0.9860 - lr:
1.0000e-05
Epoch 581/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.1641 - val_loss: 4.1218e-06 - val_r_squared: 0.9992 - lr:
1.0000e-05
Epoch 582/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0038 -
r_squared: 0.0825 - val_loss: 1.0499e-04 - val_r_squared: 0.9787 - lr:
1.0000e-05
Epoch 583/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0055 -
r_squared: -0.2271 - val_loss: 1.0840e-04 - val_r_squared: 0.9793 - lr:
1.0000e-05
Epoch 584/1000
```

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13/13 [==============================] - 0s 21ms/step - loss: 0.0041 -
r_squared: -0.0133 - val_loss: 1.2912e-05 - val_r_squared: 0.9970 - lr:
1.0000e-05
Epoch 585/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.0757 - val_loss: 9.8756e-06 - val_r_squared: 0.9982 - lr:
1.0000e-05
Epoch 586/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0036 -
r_squared: 0.1610 - val_loss: 2.3167e-05 - val_r_squared: 0.9955 - lr:
1.0000e-05
Epoch 587/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.0767 - val_loss: 1.9137e-05 - val_r_squared: 0.9966 - lr:
1.0000e-05
Epoch 588/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0244 - val_loss: 1.2738e-05 - val_r_squared: 0.9975 - lr:
1.0000e-05
Epoch 589/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0880 - val_loss: 1.3419e-05 - val_r_squared: 0.9976 - lr:
1.0000e-05
Epoch 590/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0044 -
r_squared: -0.0674 - val_loss: 1.0493e-05 - val_r_squared: 0.9973 - lr:
1.0000e-05
Epoch 591/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0044 -
r_squared: -0.0114 - val_loss: 2.2992e-05 - val_r_squared: 0.9944 - lr:
1.0000e-05
Epoch 592/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1216 - val_loss: 9.5597e-06 - val_r_squared: 0.9983 - lr:
1.0000e-05
Epoch 593/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.0620 - val_loss: 1.4741e-05 - val_r_squared: 0.9973 - lr:
1.0000e-05
Epoch 594/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.1261 - val_loss: 7.2986e-05 - val_r_squared: 0.9858 - lr:
1.0000e-05
Epoch 595/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0055 -
r_squared: -0.5330 - val_loss: 1.8891e-05 - val_r_squared: 0.9968 - lr:
1.0000e-05
Epoch 596/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0040 -
r_squared: 0.0498 - val_loss: 9.6830e-05 - val_r_squared: 0.9809 - lr:
1.0000e-05
Epoch 597/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: 0.0421 - val_loss: 3.1550e-05 - val_r_squared: 0.9940 - lr:
1.0000e-05
Epoch 598/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0041 -
r_squared: 0.0230 - val_loss: 1.3876e-05 - val_r_squared: 0.9970 - lr:
1.0000e-05
Epoch 599/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0474 - val_loss: 4.0096e-05 - val_r_squared: 0.9925 - lr:
1.0000e-05
Epoch 600/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.1977 - val_loss: 6.1510e-05 - val_r_squared: 0.9881 - lr:
1.0000e-05
Epoch 601/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0050 -
r_squared: -0.1934 - val_loss: 8.3695e-05 - val_r_squared: 0.9829 - lr:
1.0000e-05
Epoch 602/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0045 -
r_squared: -0.0589 - val_loss: 1.4525e-05 - val_r_squared: 0.9974 - lr:
1.0000e-05
Epoch 603/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0045 -
r_squared: 0.0301 - val_loss: 3.4753e-05 - val_r_squared: 0.9931 - lr:
1.0000e-05
Epoch 604/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0054 -
r_squared: -0.3123 - val_loss: 2.5199e-04 - val_r_squared: 0.9465 - lr:
1.0000e-05
Epoch 605/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.1223 - val_loss: 1.9971e-05 - val_r_squared: 0.9962 - lr:
1.0000e-05
Epoch 606/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1360 - val_loss: 7.3125e-05 - val_r_squared: 0.9846 - lr:
1.0000e-05
Epoch 607/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0043 -
r_squared: 0.0394 - val_loss: 7.3928e-05 - val_r_squared: 0.9872 - lr:
1.0000e-05
Epoch 608/1000
```

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13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.3032 - val_loss: 1.1758e-05 - val_r_squared: 0.9977 - lr:
1.0000e-05
Epoch 609/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1177 - val_loss: 3.2715e-05 - val_r_squared: 0.9935 - lr:
1.0000e-05
Epoch 610/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0040 -
r_squared: 0.0649 - val_loss: 1.3785e-05 - val_r_squared: 0.9975 - lr:
1.0000e-05
Epoch 611/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0056 -
r_squared: -0.3116 - val_loss: 8.6861e-05 - val_r_squared: 0.9823 - lr:
1.0000e-05
Epoch 612/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0051 -
r_squared: -0.2615 - val_loss: 2.4037e-04 - val_r_squared: 0.9530 - lr:
1.0000e-05
Epoch 613/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.0366 - val_loss: 5.6790e-05 - val_r_squared: 0.9885 - lr:
1.0000e-05
Epoch 614/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1018 - val_loss: 8.3738e-06 - val_r_squared: 0.9983 - lr:
1.0000e-05
Epoch 615/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0051 -
r_squared: -0.1949 - val_loss: 8.8660e-05 - val_r_squared: 0.9839 - lr:
1.0000e-05
Epoch 616/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.1396 - val_loss: 4.8982e-05 - val_r_squared: 0.9914 - lr:
1.0000e-05
Epoch 617/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: -0.3262 - val_loss: 1.5835e-05 - val_r_squared: 0.9965 - lr:
1.0000e-05
Epoch 618/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: 0.0087 - val_loss: 5.7235e-05 - val_r_squared: 0.9899 - lr:
1.0000e-05
Epoch 619/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0038 -
r_squared: 0.1209 - val_loss: 1.5786e-04 - val_r_squared: 0.9716 - lr:
1.0000e-05
Epoch 620/1000
```

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13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.0607 - val_loss: 3.3516e-05 - val_r_squared: 0.9938 - lr:
1.0000e-05
Epoch 621/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.2175 - val_loss: 1.0254e-04 - val_r_squared: 0.9799 - lr:
1.0000e-05
Epoch 622/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0041 -
r_squared: 0.1500 - val_loss: 5.5096e-06 - val_r_squared: 0.9990 - lr:
1.0000e-05
Epoch 623/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.3163 - val_loss: 1.2867e-05 - val_r_squared: 0.9976 - lr:
1.0000e-05
Epoch 624/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.0853 - val_loss: 2.0962e-05 - val_r_squared: 0.9960 - lr:
1.0000e-05
Epoch 625/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0047 -
r_squared: -0.2241 - val_loss: 7.7555e-06 - val_r_squared: 0.9986 - lr:
1.0000e-05
Epoch 626/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0047 -
r_squared: -0.1102 - val_loss: 2.4078e-05 - val_r_squared: 0.9956 - lr:
1.0000e-05
Epoch 627/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0040 -
r_squared: -0.0520 - val_loss: 6.9649e-06 - val_r_squared: 0.9988 - lr:
1.0000e-05
Epoch 628/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.1150 - val_loss: 3.9426e-05 - val_r_squared: 0.9915 - lr:
1.0000e-05
Epoch 629/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.0658 - val_loss: 5.9752e-05 - val_r_squared: 0.9891 - lr:
1.0000e-05
Epoch 630/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0041 -
r_squared: -0.1562 - val_loss: 1.6090e-04 - val_r_squared: 0.9695 - lr:
1.0000e-05
Epoch 631/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.2638 - val_loss: 1.4905e-05 - val_r_squared: 0.9975 - lr:
1.0000e-05
Epoch 632/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.2038 - val_loss: 1.1520e-05 - val_r_squared: 0.9974 - lr:
1.0000e-05
Epoch 633/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.1247 - val_loss: 5.7674e-05 - val_r_squared: 0.9899 - lr:
1.0000e-05
Epoch 634/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0036 -
r_squared: -0.0023 - val_loss: 2.8784e-05 - val_r_squared: 0.9931 - lr:
1.0000e-05
Epoch 635/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0037 -
r_squared: 0.0934 - val_loss: 1.2907e-04 - val_r_squared: 0.9721 - lr:
1.0000e-05
Epoch 636/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.1585 - val_loss: 5.0081e-06 - val_r_squared: 0.9991 - lr:
1.0000e-05
Epoch 637/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0041 -
r_squared: 0.0877 - val_loss: 4.7554e-05 - val_r_squared: 0.9906 - lr:
1.0000e-05
Epoch 638/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0048 -
r_squared: -0.1146 - val_loss: 3.2934e-05 - val_r_squared: 0.9930 - lr:
1.0000e-05
Epoch 639/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.0117 - val_loss: 5.5206e-06 - val_r_squared: 0.9985 - lr:
1.0000e-05
Epoch 640/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0045 -
r_squared: -0.1356 - val_loss: 3.4040e-05 - val_r_squared: 0.9937 - lr:
1.0000e-05
Epoch 641/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0145 - val_loss: 1.3050e-04 - val_r_squared: 0.9774 - lr:
1.0000e-05
Epoch 642/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: 0.0112 - val_loss: 4.4396e-05 - val_r_squared: 0.9907 - lr:
1.0000e-05
Epoch 643/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0046 -
r_squared: -0.1019 - val_loss: 1.7188e-05 - val_r_squared: 0.9960 - lr:
1.0000e-05
Epoch 644/1000
```

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13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.0208 - val_loss: 3.6832e-05 - val_r_squared: 0.9932 - lr:
1.0000e-05
Epoch 645/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0032 -
r_squared: 0.3000 - val_loss: 2.0728e-05 - val_r_squared: 0.9958 - lr:
1.0000e-05
Epoch 646/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0042 -
r_squared: 0.0044 - val_loss: 3.4197e-06 - val_r_squared: 0.9994 - lr:
1.0000e-05
Epoch 647/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0044 -
r_squared: -0.0016 - val_loss: 1.8419e-05 - val_r_squared: 0.9966 - lr:
1.0000e-05
Epoch 648/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0046 -
r_squared: -0.0328 - val_loss: 4.9432e-05 - val_r_squared: 0.9902 - lr:
1.0000e-05
Epoch 649/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0040 -
r_squared: 0.0621 - val_loss: 3.8174e-05 - val_r_squared: 0.9934 - lr:
1.0000e-05
Epoch 650/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: 0.0974 - val_loss: 3.2185e-05 - val_r_squared: 0.9945 - lr:
1.0000e-05
Epoch 651/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.3488 - val_loss: 2.0576e-05 - val_r_squared: 0.9963 - lr:
1.0000e-05
Epoch 652/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0045 -
r_squared: -0.0159 - val_loss: 1.0293e-04 - val_r_squared: 0.9799 - lr:
1.0000e-05
Epoch 653/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0052 -
r_squared: -0.2244 - val_loss: 5.8849e-05 - val_r_squared: 0.9881 - lr:
1.0000e-05
Epoch 654/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.2422 - val_loss: 8.4436e-05 - val_r_squared: 0.9838 - lr:
1.0000e-05
Epoch 655/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0047 -
r_squared: -0.1458 - val_loss: 3.4627e-06 - val_r_squared: 0.9993 - lr:
1.0000e-05
Epoch 656/1000
```

```
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0615 - val_loss: 1.0891e-05 - val_r_squared: 0.9973 - lr:
1.0000e-05
Epoch 657/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0045 -
r_squared: 0.0314 - val_loss: 2.9793e-05 - val_r_squared: 0.9949 - lr:
1.0000e-05
Epoch 658/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.0181 - val_loss: 1.2426e-04 - val_r_squared: 0.9782 - lr:
1.0000e-05
Epoch 659/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0042 -
r_squared: 0.0011 - val_loss: 9.7989e-05 - val_r_squared: 0.9775 - lr:
1.0000e-05
Epoch 660/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.0679 - val_loss: 4.8839e-05 - val_r_squared: 0.9912 - lr:
1.0000e-05
Epoch 661/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0048 -
r_squared: -0.3009 - val_loss: 3.2459e-05 - val_r_squared: 0.9936 - lr:
1.0000e-05
Epoch 662/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1285 - val_loss: 4.6827e-05 - val_r_squared: 0.9906 - lr:
1.0000e-05
Epoch 663/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0046 - val_loss: 5.4465e-06 - val_r_squared: 0.9990 - lr:
1.0000e-05
Epoch 664/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0041 -
r_squared: 0.0691 - val_loss: 6.3085e-06 - val_r_squared: 0.9989 - lr:
1.0000e-05
Epoch 665/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0035 -
r_squared: 0.2085 - val_loss: 1.5706e-05 - val_r_squared: 0.9970 - lr:
1.0000e-05
Epoch 666/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0038 -
r_squared: 0.1634 - val_loss: 1.1571e-04 - val_r_squared: 0.9759 - lr:
1.0000e-05
Epoch 667/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0051 -
r_squared: -0.1190 - val_loss: 2.6214e-05 - val_r_squared: 0.9955 - lr:
1.0000e-05
Epoch 668/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0127 - val_loss: 1.0146e-04 - val_r_squared: 0.9815 - lr:
1.0000e-05
Epoch 669/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0030 - val_loss: 3.1002e-06 - val_r_squared: 0.9993 - lr:
1.0000e-05
Epoch 670/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.1901 - val_loss: 3.2562e-06 - val_r_squared: 0.9994 - lr:
1.0000e-05
Epoch 671/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.2529 - val_loss: 4.8606e-06 - val_r_squared: 0.9991 - lr:
1.0000e-05
Epoch 672/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0051 -
r_squared: -0.1583 - val_loss: 7.4995e-06 - val_r_squared: 0.9987 - lr:
1.0000e-05
Epoch 673/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0047 -
r_squared: -0.1401 - val_loss: 9.0922e-05 - val_r_squared: 0.9809 - lr:
1.0000e-05
Epoch 674/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.1437 - val_loss: 7.2586e-06 - val_r_squared: 0.9988 - lr:
1.0000e-05
Epoch 675/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: 0.0595 - val_loss: 5.3736e-05 - val_r_squared: 0.9904 - lr:
1.0000e-05
Epoch 676/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0056 -
r_squared: -0.3245 - val_loss: 8.7187e-06 - val_r_squared: 0.9978 - lr:
1.0000e-05
Epoch 677/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0053 -
r_squared: -0.2468 - val_loss: 2.6443e-05 - val_r_squared: 0.9955 - lr:
1.0000e-05
Epoch 678/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0050 -
r_squared: -0.2411 - val_loss: 2.1758e-05 - val_r_squared: 0.9957 - lr:
1.0000e-05
Epoch 679/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0054 -
r_squared: -0.2514 - val_loss: 9.3133e-05 - val_r_squared: 0.9840 - lr:
1.0000e-05
Epoch 680/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1829 - val_loss: 9.9652e-06 - val_r_squared: 0.9983 - lr:
1.0000e-05
Epoch 681/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0044 -
r_squared: -0.0282 - val_loss: 7.2110e-05 - val_r_squared: 0.9865 - lr:
1.0000e-05
Epoch 682/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0050 -
r_squared: -0.0952 - val_loss: 1.0729e-04 - val_r_squared: 0.9800 - lr:
1.0000e-05
Epoch 683/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0982 - val_loss: 2.3305e-05 - val_r_squared: 0.9950 - lr:
1.0000e-05
Epoch 684/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.0237 - val_loss: 2.2325e-04 - val_r_squared: 0.9525 - lr:
1.0000e-05
Epoch 685/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: -0.1357 - val_loss: 2.0926e-04 - val_r_squared: 0.9563 - lr:
1.0000e-05
Epoch 686/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0054 -
r_squared: -0.3050 - val_loss: 8.7714e-05 - val_r_squared: 0.9823 - lr:
1.0000e-05
Epoch 687/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0040 -
r_squared: 0.0860 - val_loss: 7.0060e-05 - val_r_squared: 0.9853 - lr:
1.0000e-05
Epoch 688/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: 0.0302 - val_loss: 1.8327e-05 - val_r_squared: 0.9958 - lr:
1.0000e-05
Epoch 689/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0048 -
r_squared: -0.2211 - val_loss: 2.1357e-05 - val_r_squared: 0.9948 - lr:
1.0000e-05
Epoch 690/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0469 - val_loss: 6.2300e-05 - val_r_squared: 0.9888 - lr:
1.0000e-05
Epoch 691/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0039 -
r_squared: 0.0423 - val_loss: 2.6023e-05 - val_r_squared: 0.9937 - lr:
1.0000e-05
Epoch 692/1000
```

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13/13 [==============================] - 0s 23ms/step - loss: 0.0035 -
r_squared: 0.1963 - val_loss: 1.1355e-05 - val_r_squared: 0.9981 - lr:
1.0000e-05
Epoch 693/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.1278 - val_loss: 8.1390e-05 - val_r_squared: 0.9830 - lr:
1.0000e-05
Epoch 694/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.2016 - val_loss: 1.1428e-04 - val_r_squared: 0.9802 - lr:
1.0000e-05
Epoch 695/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0034 -
r_squared: 0.2540 - val_loss: 1.1949e-04 - val_r_squared: 0.9793 - lr:
1.0000e-05
Epoch 696/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.0485 - val_loss: 9.1121e-05 - val_r_squared: 0.9830 - lr:
1.0000e-05
Epoch 697/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: -0.1402 - val_loss: 1.5653e-04 - val_r_squared: 0.9679 - lr:
1.0000e-05
Epoch 698/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.1539 - val_loss: 1.6479e-04 - val_r_squared: 0.9650 - lr:
1.0000e-05
Epoch 699/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: 0.0120 - val_loss: 1.1277e-04 - val_r_squared: 0.9792 - lr:
1.0000e-05
Epoch 700/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0347 - val_loss: 6.0831e-06 - val_r_squared: 0.9989 - lr:
1.0000e-05
Epoch 701/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0046 -
r_squared: -0.1016 - val_loss: 2.3150e-05 - val_r_squared: 0.9957 - lr:
1.0000e-05
Epoch 702/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0040 -
r_squared: -0.0088 - val_loss: 2.7480e-05 - val_r_squared: 0.9937 - lr:
1.0000e-05
Epoch 703/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0043 -
r_squared: 0.0604 - val_loss: 3.2349e-05 - val_r_squared: 0.9939 - lr:
1.0000e-05
Epoch 704/1000
```

```
13/13 [==============================] - 0s 21ms/step - loss: 0.0046 -
r_squared: -0.1085 - val_loss: 1.6457e-05 - val_r_squared: 0.9971 - lr:
1.0000e-05
Epoch 705/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.1240 - val_loss: 2.4100e-05 - val_r_squared: 0.9955 - lr:
1.0000e-05
Epoch 706/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0711 - val_loss: 2.6418e-06 - val_r_squared: 0.9994 - lr:
1.0000e-05
Epoch 707/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0039 -
r_squared: 0.1291 - val_loss: 8.5141e-06 - val_r_squared: 0.9986 - lr:
1.0000e-05
Epoch 708/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0051 -
r_squared: -0.2511 - val_loss: 2.8740e-05 - val_r_squared: 0.9946 - lr:
1.0000e-05
Epoch 709/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0039 -
r_squared: 0.1491 - val_loss: 7.4167e-05 - val_r_squared: 0.9851 - lr:
1.0000e-05
Epoch 710/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0041 -
r_squared: 0.0760 - val_loss: 7.2588e-05 - val_r_squared: 0.9856 - lr:
1.0000e-05
Epoch 711/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0042 -
r_squared: -0.1116 - val_loss: 2.6784e-05 - val_r_squared: 0.9952 - lr:
1.0000e-05
Epoch 712/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.2252 - val_loss: 6.9033e-05 - val_r_squared: 0.9877 - lr:
1.0000e-05
Epoch 713/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0051 -
r_squared: -0.1986 - val_loss: 3.2185e-05 - val_r_squared: 0.9939 - lr:
1.0000e-05
Epoch 714/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0040 -
r_squared: 0.0531 - val_loss: 1.3848e-04 - val_r_squared: 0.9718 - lr:
1.0000e-05
Epoch 715/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0040 -
r_squared: 0.0248 - val_loss: 2.4124e-05 - val_r_squared: 0.9952 - lr:
1.0000e-05
Epoch 716/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.1801 - val_loss: 6.5473e-05 - val_r_squared: 0.9874 - lr:
1.0000e-05
Epoch 717/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0056 -
r_squared: -0.3023 - val_loss: 2.2664e-04 - val_r_squared: 0.9567 - lr:
1.0000e-05
Epoch 718/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0044 -
r_squared: 0.0151 - val_loss: 4.1410e-06 - val_r_squared: 0.9993 - lr:
1.0000e-05
Epoch 719/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.0283 - val_loss: 8.3035e-05 - val_r_squared: 0.9837 - lr:
1.0000e-05
Epoch 720/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.1048 - val_loss: 5.9465e-06 - val_r_squared: 0.9989 - lr:
1.0000e-05
Epoch 721/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.0061 - val_loss: 1.1065e-05 - val_r_squared: 0.9980 - lr:
1.0000e-05
Epoch 722/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.1855 - val_loss: 8.8715e-06 - val_r_squared: 0.9984 - lr:
1.0000e-05
Epoch 723/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0040 -
r_squared: 0.0794 - val_loss: 8.5069e-06 - val_r_squared: 0.9979 - lr:
1.0000e-05
Epoch 724/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0209 - val_loss: 4.3884e-06 - val_r_squared: 0.9992 - lr:
1.0000e-05
Epoch 725/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.1443 - val_loss: 6.7918e-05 - val_r_squared: 0.9865 - lr:
1.0000e-05
Epoch 726/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.0016 - val_loss: 3.7149e-05 - val_r_squared: 0.9924 - lr:
1.0000e-05
Epoch 727/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0040 -
r_squared: -0.0423 - val_loss: 4.0956e-06 - val_r_squared: 0.9992 - lr:
1.0000e-05
Epoch 728/1000
```

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13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.2331 - val_loss: 2.5862e-05 - val_r_squared: 0.9952 - lr:
1.0000e-05
Epoch 729/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.0012 - val_loss: 1.2684e-05 - val_r_squared: 0.9978 - lr:
1.0000e-05
Epoch 730/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0040 -
r_squared: -0.0107 - val_loss: 3.0645e-05 - val_r_squared: 0.9948 - lr:
1.0000e-05
Epoch 731/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0054 -
r_squared: -0.3063 - val_loss: 2.7619e-05 - val_r_squared: 0.9936 - lr:
1.0000e-05
Epoch 732/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0038 -
r_squared: 0.0882 - val_loss: 3.8649e-06 - val_r_squared: 0.9994 - lr:
1.0000e-05
Epoch 733/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.1492 - val_loss: 3.3590e-05 - val_r_squared: 0.9933 - lr:
1.0000e-05
Epoch 734/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0041 -
r_squared: 0.0678 - val_loss: 2.4216e-05 - val_r_squared: 0.9956 - lr:
1.0000e-05
Epoch 735/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0858 - val_loss: 1.2586e-04 - val_r_squared: 0.9739 - lr:
1.0000e-05
Epoch 736/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0039 -
r_squared: 0.0917 - val_loss: 3.5099e-05 - val_r_squared: 0.9937 - lr:
1.0000e-05
Epoch 737/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0035 -
r_squared: 0.2048 - val_loss: 4.6869e-05 - val_r_squared: 0.9903 - lr:
1.0000e-05
Epoch 738/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0051 -
r_squared: -0.2492 - val_loss: 9.6311e-05 - val_r_squared: 0.9812 - lr:
1.0000e-05
Epoch 739/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1060 - val_loss: 7.3130e-05 - val_r_squared: 0.9860 - lr:
1.0000e-05
Epoch 740/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0038 -
r_squared: 0.1112 - val_loss: 2.3117e-04 - val_r_squared: 0.9553 - lr:
1.0000e-05
Epoch 741/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0048 -
r_squared: -0.1431 - val_loss: 3.5455e-05 - val_r_squared: 0.9917 - lr:
1.0000e-05
Epoch 742/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.2505 - val_loss: 5.4025e-05 - val_r_squared: 0.9879 - lr:
1.0000e-05
Epoch 743/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0041 -
r_squared: -0.0631 - val_loss: 1.2986e-05 - val_r_squared: 0.9972 - lr:
1.0000e-05
Epoch 744/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: 0.0147 - val_loss: 9.5164e-06 - val_r_squared: 0.9984 - lr:
1.0000e-05
Epoch 745/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0040 -
r_squared: 0.0780 - val_loss: 9.9353e-06 - val_r_squared: 0.9976 - lr:
1.0000e-05
Epoch 746/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: -0.0710 - val_loss: 2.1426e-05 - val_r_squared: 0.9963 - lr:
1.0000e-05
Epoch 747/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.0888 - val_loss: 1.1234e-05 - val_r_squared: 0.9973 - lr:
1.0000e-05
Epoch 748/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0036 -
r_squared: 0.2425 - val_loss: 1.5385e-05 - val_r_squared: 0.9965 - lr:
1.0000e-05
Epoch 749/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0060 -
r_squared: -0.3668 - val_loss: 2.0862e-05 - val_r_squared: 0.9958 - lr:
1.0000e-05
Epoch 750/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0036 -
r_squared: 0.1686 - val_loss: 3.0396e-05 - val_r_squared: 0.9940 - lr:
1.0000e-05
Epoch 751/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0042 -
r_squared: 0.0295 - val_loss: 7.8266e-06 - val_r_squared: 0.9986 - lr:
1.0000e-05
Epoch 752/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0039 -
r_squared: 0.1115 - val_loss: 1.1274e-05 - val_r_squared: 0.9980 - lr:
1.0000e-05
Epoch 753/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0041 -
r_squared: -0.0115 - val_loss: 3.0830e-05 - val_r_squared: 0.9941 - lr:
1.0000e-05
Epoch 754/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0055 -
r_squared: -0.2858 - val_loss: 2.1088e-05 - val_r_squared: 0.9958 - lr:
1.0000e-05
Epoch 755/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0039 -
r_squared: 0.0330 - val_loss: 2.4767e-05 - val_r_squared: 0.9943 - lr:
1.0000e-05
Epoch 756/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0035 -
r_squared: 0.1460 - val_loss: 7.2088e-05 - val_r_squared: 0.9846 - lr:
1.0000e-05
Epoch 757/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0042 -
r_squared: -0.0045 - val_loss: 7.7897e-05 - val_r_squared: 0.9861 - lr:
1.0000e-05
Epoch 758/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0039 -
r_squared: 0.0292 - val_loss: 1.1038e-04 - val_r_squared: 0.9750 - lr:
1.0000e-05
Epoch 759/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: 0.0479 - val_loss: 8.1593e-05 - val_r_squared: 0.9859 - lr:
1.0000e-05
Epoch 760/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.0973 - val_loss: 1.1946e-05 - val_r_squared: 0.9972 - lr:
1.0000e-05
Epoch 761/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.2309 - val_loss: 3.5911e-05 - val_r_squared: 0.9931 - lr:
1.0000e-05
Epoch 762/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0037 -
r_squared: 0.1107 - val_loss: 3.2203e-05 - val_r_squared: 0.9939 - lr:
1.0000e-05
Epoch 763/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0158 - val_loss: 5.1331e-05 - val_r_squared: 0.9909 - lr:
1.0000e-05
Epoch 764/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0055 -
r_squared: -0.3860 - val_loss: 3.1566e-05 - val_r_squared: 0.9935 - lr:
1.0000e-05
Epoch 765/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0039 -
r_squared: -0.1809 - val_loss: 2.7128e-05 - val_r_squared: 0.9951 - lr:
1.0000e-05
Epoch 766/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: 0.0233 - val_loss: 1.0417e-05 - val_r_squared: 0.9982 - lr:
1.0000e-05
Epoch 767/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0038 -
r_squared: 0.1679 - val_loss: 6.5878e-05 - val_r_squared: 0.9851 - lr:
1.0000e-05
Epoch 768/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.0357 - val_loss: 4.1701e-05 - val_r_squared: 0.9903 - lr:
1.0000e-05
Epoch 769/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.1738 - val_loss: 3.6798e-04 - val_r_squared: 0.9276 - lr:
1.0000e-05
Epoch 770/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: -0.1141 - val_loss: 1.1500e-05 - val_r_squared: 0.9980 - lr:
1.0000e-05
Epoch 771/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0050 -
r_squared: -0.2557 - val_loss: 1.4867e-05 - val_r_squared: 0.9974 - lr:
1.0000e-05
Epoch 772/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0216 - val_loss: 5.1262e-06 - val_r_squared: 0.9991 - lr:
1.0000e-05
Epoch 773/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0055 -
r_squared: -0.2314 - val_loss: 7.2651e-06 - val_r_squared: 0.9987 - lr:
1.0000e-05
Epoch 774/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0137 - val_loss: 1.5635e-05 - val_r_squared: 0.9966 - lr:
1.0000e-05
Epoch 775/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0051 -
r_squared: -0.2533 - val_loss: 1.3586e-04 - val_r_squared: 0.9763 - lr:
1.0000e-05
Epoch 776/1000
```

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13/13 [==============================] - 0s 21ms/step - loss: 0.0047 -
r_squared: -0.0938 - val_loss: 2.3472e-05 - val_r_squared: 0.9946 - lr:
1.0000e-05
Epoch 777/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.1425 - val_loss: 7.0372e-06 - val_r_squared: 0.9987 - lr:
1.0000e-05
Epoch 778/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0039 -
r_squared: 0.0805 - val_loss: 6.7867e-05 - val_r_squared: 0.9866 - lr:
1.0000e-05
Epoch 779/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0046 -
r_squared: -0.1103 - val_loss: 1.3163e-05 - val_r_squared: 0.9975 - lr:
1.0000e-05
Epoch 780/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.1043 - val_loss: 5.8298e-05 - val_r_squared: 0.9879 - lr:
1.0000e-05
Epoch 781/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0051 -
r_squared: -0.1200 - val_loss: 7.3256e-05 - val_r_squared: 0.9873 - lr:
1.0000e-05
Epoch 782/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.0341 - val_loss: 1.1248e-04 - val_r_squared: 0.9746 - lr:
1.0000e-05
Epoch 783/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0040 -
r_squared: 0.0897 - val_loss: 5.5616e-05 - val_r_squared: 0.9880 - lr:
1.0000e-05
Epoch 784/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: 0.0031 - val_loss: 9.1750e-06 - val_r_squared: 0.9983 - lr:
1.0000e-05
Epoch 785/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.0274 - val_loss: 1.7801e-05 - val_r_squared: 0.9968 - lr:
1.0000e-05
Epoch 786/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.1940 - val_loss: 1.3639e-04 - val_r_squared: 0.9712 - lr:
1.0000e-05
Epoch 787/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.1694 - val_loss: 3.7753e-05 - val_r_squared: 0.9932 - lr:
1.0000e-05
Epoch 788/1000
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13/13 [==============================] - 0s 22ms/step - loss: 0.0041 -
r_squared: 0.0435 - val_loss: 1.5666e-05 - val_r_squared: 0.9967 - lr:
1.0000e-05
Epoch 789/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.1323 - val_loss: 6.1481e-05 - val_r_squared: 0.9889 - lr:
1.0000e-05
Epoch 790/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.0530 - val_loss: 3.5168e-05 - val_r_squared: 0.9938 - lr:
1.0000e-05
Epoch 791/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0040 -
r_squared: 0.0342 - val_loss: 2.4796e-05 - val_r_squared: 0.9958 - lr:
1.0000e-05
Epoch 792/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: -0.0250 - val_loss: 6.3210e-06 - val_r_squared: 0.9989 - lr:
1.0000e-05
Epoch 793/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0049 -
r_squared: -0.8129 - val_loss: 7.7712e-05 - val_r_squared: 0.9853 - lr:
1.0000e-05
Epoch 794/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0027 - val_loss: 6.1020e-05 - val_r_squared: 0.9875 - lr:
1.0000e-05
Epoch 795/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.1017 - val_loss: 3.6589e-05 - val_r_squared: 0.9927 - lr:
1.0000e-05
Epoch 796/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.1085 - val_loss: 7.2375e-05 - val_r_squared: 0.9866 - lr:
1.0000e-05
Epoch 797/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.2287 - val_loss: 4.6245e-05 - val_r_squared: 0.9904 - lr:
1.0000e-05
Epoch 798/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.1483 - val_loss: 3.4139e-06 - val_r_squared: 0.9992 - lr:
1.0000e-05
Epoch 799/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0051 -
r_squared: -0.2250 - val_loss: 4.5529e-05 - val_r_squared: 0.9914 - lr:
1.0000e-05
Epoch 800/1000
```

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13/13 [==============================] - 0s 21ms/step - loss: 0.0041 -
r_squared: 0.0674 - val_loss: 5.8414e-05 - val_r_squared: 0.9896 - lr:
1.0000e-05
Epoch 801/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.1244 - val_loss: 8.5605e-05 - val_r_squared: 0.9836 - lr:
1.0000e-05
Epoch 802/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0051 -
r_squared: -0.1121 - val_loss: 2.0758e-05 - val_r_squared: 0.9959 - lr:
1.0000e-05
Epoch 803/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0050 -
r_squared: -0.1696 - val_loss: 1.2149e-05 - val_r_squared: 0.9979 - lr:
1.0000e-05
Epoch 804/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0041 -
r_squared: 0.1099 - val_loss: 6.4226e-05 - val_r_squared: 0.9889 - lr:
1.0000e-05
Epoch 805/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0048 -
r_squared: -0.0872 - val_loss: 1.0833e-05 - val_r_squared: 0.9980 - lr:
1.0000e-05
Epoch 806/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0044 -
r_squared: 0.0030 - val_loss: 4.4546e-06 - val_r_squared: 0.9992 - lr:
1.0000e-05
Epoch 807/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0041 -
r_squared: 0.0320 - val_loss: 5.2862e-06 - val_r_squared: 0.9988 - lr:
1.0000e-05
Epoch 808/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0037 -
r_squared: 0.0513 - val_loss: 1.8813e-05 - val_r_squared: 0.9967 - lr:
1.0000e-05
Epoch 809/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: 0.0496 - val_loss: 3.1732e-05 - val_r_squared: 0.9939 - lr:
1.0000e-05
Epoch 810/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: -0.0420 - val_loss: 2.7913e-05 - val_r_squared: 0.9949 - lr:
1.0000e-05
Epoch 811/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0040 -
r_squared: 0.0229 - val_loss: 5.9806e-05 - val_r_squared: 0.9877 - lr:
1.0000e-05
Epoch 812/1000
```

```
13/13 [==============================] - 0s 22ms/step - loss: 0.0051 -
r_squared: -0.2418 - val_loss: 6.7725e-05 - val_r_squared: 0.9864 - lr:
1.0000e-05
Epoch 813/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.0938 - val_loss: 3.6738e-06 - val_r_squared: 0.9991 - lr:
1.0000e-05
Epoch 814/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.1865 - val_loss: 1.8587e-05 - val_r_squared: 0.9957 - lr:
1.0000e-05
Epoch 815/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.2171 - val_loss: 2.9097e-05 - val_r_squared: 0.9947 - lr:
1.0000e-05
Epoch 816/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0040 -
r_squared: 0.1297 - val_loss: 1.2330e-04 - val_r_squared: 0.9761 - lr:
1.0000e-05
Epoch 817/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0617 - val_loss: 3.4228e-05 - val_r_squared: 0.9937 - lr:
1.0000e-05
Epoch 818/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0058 -
r_squared: -0.3640 - val_loss: 4.4398e-05 - val_r_squared: 0.9910 - lr:
1.0000e-05
Epoch 819/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.1320 - val_loss: 3.7281e-05 - val_r_squared: 0.9913 - lr:
1.0000e-05
Epoch 820/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0052 -
r_squared: -0.3400 - val_loss: 1.8220e-05 - val_r_squared: 0.9961 - lr:
1.0000e-05
Epoch 821/1000
13/13 [==============================] - 0s 27ms/step - loss: 0.0035 -
r_squared: 0.1040 - val_loss: 3.1546e-05 - val_r_squared: 0.9942 - lr:
1.0000e-05
Epoch 822/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0038 -
r_squared: 0.1332 - val_loss: 3.3448e-06 - val_r_squared: 0.9994 - lr:
1.0000e-05
Epoch 823/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.0149 - val_loss: 3.0587e-06 - val_r_squared: 0.9994 - lr:
1.0000e-05
Epoch 824/1000
```

```
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.2351 - val_loss: 3.7023e-05 - val_r_squared: 0.9933 - lr:
1.0000e-05
Epoch 825/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0049 -
r_squared: -0.1308 - val_loss: 1.7685e-04 - val_r_squared: 0.9654 - lr:
1.0000e-05
Epoch 826/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.0244 - val_loss: 2.1864e-06 - val_r_squared: 0.9995 - lr:
1.0000e-05
Epoch 827/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0040 -
r_squared: 0.1128 - val_loss: 1.1403e-05 - val_r_squared: 0.9973 - lr:
1.0000e-05
Epoch 828/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.0314 - val_loss: 2.3879e-05 - val_r_squared: 0.9957 - lr:
1.0000e-05
Epoch 829/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.1370 - val_loss: 6.0081e-05 - val_r_squared: 0.9893 - lr:
1.0000e-05
Epoch 830/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.1036 - val_loss: 7.5133e-05 - val_r_squared: 0.9865 - lr:
1.0000e-05
Epoch 831/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.0017 - val_loss: 1.6292e-05 - val_r_squared: 0.9966 - lr:
1.0000e-05
Epoch 832/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0038 -
r_squared: 0.1664 - val_loss: 3.3514e-05 - val_r_squared: 0.9931 - lr:
1.0000e-05
Epoch 833/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.0460 - val_loss: 3.7216e-06 - val_r_squared: 0.9994 - lr:
1.0000e-05
Epoch 834/1000
13/13 [==============================] - 0s 21ms/step - loss: 0.0050 -
r_squared: -0.2707 - val_loss: 2.2830e-05 - val_r_squared: 0.9946 - lr:
1.0000e-05
Epoch 835/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0044 -
r_squared: -0.1023 - val_loss: 5.0600e-05 - val_r_squared: 0.9891 - lr:
1.0000e-05
Epoch 836/1000
```

```
13/13 [==============================] - 0s 24ms/step - loss: 0.0039 -
r_squared: 0.0790 - val_loss: 6.6436e-05 - val_r_squared: 0.9862 - lr:
1.0000e-05
Epoch 837/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0042 -
r_squared: 0.0698 - val_loss: 1.7915e-05 - val_r_squared: 0.9960 - lr:
1.0000e-05
Epoch 838/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0050 -
r_squared: -0.1359 - val_loss: 1.3719e-05 - val_r_squared: 0.9975 - lr:
1.0000e-05
Epoch 839/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0049 -
r_squared: -0.2497 - val_loss: 1.1380e-04 - val_r_squared: 0.9787 - lr:
1.0000e-05
Epoch 840/1000
13/13 [==============================] - 0s 27ms/step - loss: 0.0048 -
r_squared: -0.1035 - val_loss: 4.8698e-05 - val_r_squared: 0.9900 - lr:
1.0000e-05
Epoch 841/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0050 -
r_squared: -0.1673 - val_loss: 2.0088e-05 - val_r_squared: 0.9961 - lr:
1.0000e-05
Epoch 842/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0041 -
r_squared: -0.0695 - val_loss: 1.2194e-05 - val_r_squared: 0.9979 - lr:
1.0000e-05
Epoch 843/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0044 -
r_squared: 0.0152 - val_loss: 9.3025e-05 - val_r_squared: 0.9810 - lr:
1.0000e-05
Epoch 844/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0046 -
r_squared: -0.7684 - val_loss: 1.2338e-04 - val_r_squared: 0.9754 - lr:
1.0000e-05
Epoch 845/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0037 -
r_squared: 0.0965 - val_loss: 2.3941e-04 - val_r_squared: 0.9506 - lr:
1.0000e-05
Epoch 846/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0053 -
r_squared: -0.2848 - val_loss: 4.3192e-05 - val_r_squared: 0.9925 - lr:
1.0000e-05
Epoch 847/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0040 -
r_squared: 0.0375 - val_loss: 6.4624e-05 - val_r_squared: 0.9867 - lr:
1.0000e-05
Epoch 848/1000
```

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13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.0549 - val_loss: 3.3970e-05 - val_r_squared: 0.9939 - lr:
1.0000e-05
Epoch 849/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0044 -
r_squared: 0.0506 - val_loss: 1.5151e-05 - val_r_squared: 0.9973 - lr:
1.0000e-05
Epoch 850/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0037 -
r_squared: 0.0879 - val_loss: 1.3051e-04 - val_r_squared: 0.9731 - lr:
1.0000e-05
Epoch 851/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0043 -
r_squared: -1.2892 - val_loss: 3.9981e-05 - val_r_squared: 0.9927 - lr:
1.0000e-05
Epoch 852/1000
13/13 [==============================] - 0s 28ms/step - loss: 0.0039 -
r_squared: 0.1082 - val_loss: 4.3682e-05 - val_r_squared: 0.9918 - lr:
1.0000e-05
Epoch 853/1000
13/13 [==============================] - 0s 27ms/step - loss: 0.0046 -
r_squared: -0.0197 - val_loss: 8.5470e-05 - val_r_squared: 0.9837 - lr:
1.0000e-05
Epoch 854/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0043 -
r_squared: 0.0669 - val_loss: 2.3439e-05 - val_r_squared: 0.9958 - lr:
1.0000e-05
Epoch 855/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0048 -
r_squared: -0.2493 - val_loss: 1.5349e-05 - val_r_squared: 0.9968 - lr:
1.0000e-05
Epoch 856/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0044 -
r_squared: -0.0932 - val_loss: 4.6862e-05 - val_r_squared: 0.9907 - lr:
1.0000e-05
Epoch 857/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0044 -
r_squared: -0.0459 - val_loss: 5.3700e-05 - val_r_squared: 0.9907 - lr:
1.0000e-05
Epoch 858/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0038 -
r_squared: 0.1178 - val_loss: 7.8498e-05 - val_r_squared: 0.9862 - lr:
1.0000e-05
Epoch 859/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0040 -
r_squared: -0.1512 - val_loss: 3.0975e-06 - val_r_squared: 0.9994 - lr:
1.0000e-05
Epoch 860/1000
```

```
13/13 [==============================] - 0s 24ms/step - loss: 0.0037 -
r_squared: 0.1662 - val_loss: 4.5546e-05 - val_r_squared: 0.9908 - lr:
1.0000e-05
Epoch 861/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0043 -
r_squared: -0.1199 - val_loss: 8.7787e-06 - val_r_squared: 0.9984 - lr:
1.0000e-05
Epoch 862/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: 0.0078 - val_loss: 7.6184e-06 - val_r_squared: 0.9987 - lr:
1.0000e-05
Epoch 863/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: 0.0163 - val_loss: 5.4010e-05 - val_r_squared: 0.9898 - lr:
1.0000e-05
Epoch 864/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: 0.0194 - val_loss: 6.7256e-05 - val_r_squared: 0.9873 - lr:
1.0000e-05
Epoch 865/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.1326 - val_loss: 6.2304e-06 - val_r_squared: 0.9989 - lr:
1.0000e-05
Epoch 866/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0040 -
r_squared: 0.1037 - val_loss: 4.0589e-05 - val_r_squared: 0.9926 - lr:
1.0000e-05
Epoch 867/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.0323 - val_loss: 1.8652e-05 - val_r_squared: 0.9957 - lr:
1.0000e-05
Epoch 868/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.2155 - val_loss: 1.2479e-04 - val_r_squared: 0.9735 - lr:
1.0000e-05
Epoch 869/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.1285 - val_loss: 2.4318e-05 - val_r_squared: 0.9945 - lr:
1.0000e-05
Epoch 870/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0052 -
r_squared: -0.3353 - val_loss: 2.7021e-04 - val_r_squared: 0.9455 - lr:
1.0000e-05
Epoch 871/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0045 -
r_squared: -0.0977 - val_loss: 1.1634e-05 - val_r_squared: 0.9978 - lr:
1.0000e-05
Epoch 872/1000
```

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13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: 0.0108 - val_loss: 4.8035e-06 - val_r_squared: 0.9992 - lr:
1.0000e-05
Epoch 873/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.0828 - val_loss: 3.4948e-05 - val_r_squared: 0.9922 - lr:
1.0000e-05
Epoch 874/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: 0.0071 - val_loss: 7.7684e-06 - val_r_squared: 0.9983 - lr:
1.0000e-05
Epoch 875/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0043 -
r_squared: -0.0730 - val_loss: 1.8424e-05 - val_r_squared: 0.9966 - lr:
1.0000e-05
Epoch 876/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: -0.2265 - val_loss: 1.8986e-05 - val_r_squared: 0.9967 - lr:
1.0000e-05
Epoch 877/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.1040 - val_loss: 2.5720e-05 - val_r_squared: 0.9955 - lr:
1.0000e-05
Epoch 878/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0040 -
r_squared: 0.0767 - val_loss: 6.2570e-05 - val_r_squared: 0.9889 - lr:
1.0000e-05
Epoch 879/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0047 -
r_squared: -0.1355 - val_loss: 1.0264e-05 - val_r_squared: 0.9982 - lr:
1.0000e-05
Epoch 880/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0045 -
r_squared: -0.1207 - val_loss: 2.3611e-05 - val_r_squared: 0.9954 - lr:
1.0000e-05
Epoch 881/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0040 -
r_squared: 0.0517 - val_loss: 1.1982e-05 - val_r_squared: 0.9979 - lr:
1.0000e-05
Epoch 882/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: -0.0495 - val_loss: 2.9836e-05 - val_r_squared: 0.9936 - lr:
1.0000e-05
Epoch 883/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: 0.0595 - val_loss: 4.2090e-05 - val_r_squared: 0.9917 - lr:
1.0000e-05
Epoch 884/1000
```

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13/13 [==============================] - 0s 24ms/step - loss: 0.0041 -
r_squared: -0.0068 - val_loss: 4.1383e-05 - val_r_squared: 0.9924 - lr:
1.0000e-05
Epoch 885/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0042 -
r_squared: -0.0743 - val_loss: 5.0149e-06 - val_r_squared: 0.9990 - lr:
1.0000e-05
Epoch 886/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0044 -
r_squared: -0.7671 - val_loss: 7.5384e-06 - val_r_squared: 0.9985 - lr:
1.0000e-05
Epoch 887/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0048 -
r_squared: -0.0688 - val_loss: 5.2825e-05 - val_r_squared: 0.9897 - lr:
1.0000e-05
Epoch 888/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0047 -
r_squared: -0.1001 - val_loss: 7.5361e-06 - val_r_squared: 0.9987 - lr:
1.0000e-05
Epoch 889/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.0293 - val_loss: 5.7307e-05 - val_r_squared: 0.9891 - lr:
1.0000e-05
Epoch 890/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0040 -
r_squared: 0.0267 - val_loss: 8.5455e-06 - val_r_squared: 0.9985 - lr:
1.0000e-05
Epoch 891/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0048 -
r_squared: -0.2756 - val_loss: 4.4555e-06 - val_r_squared: 0.9989 - lr:
1.0000e-05
Epoch 892/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.2769 - val_loss: 2.8865e-05 - val_r_squared: 0.9944 - lr:
1.0000e-05
Epoch 893/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.0154 - val_loss: 2.4289e-05 - val_r_squared: 0.9954 - lr:
1.0000e-05
Epoch 894/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0050 -
r_squared: -0.1951 - val_loss: 1.4372e-05 - val_r_squared: 0.9974 - lr:
1.0000e-05
Epoch 895/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0033 -
r_squared: 0.1018 - val_loss: 1.6750e-05 - val_r_squared: 0.9967 - lr:
1.0000e-05
Epoch 896/1000
```

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13/13 [==============================] - 0s 25ms/step - loss: 0.0048 -
r_squared: -0.2570 - val_loss: 2.3324e-06 - val_r_squared: 0.9995 - lr:
1.0000e-05
Epoch 897/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0045 -
r_squared: 0.0268 - val_loss: 3.2395e-05 - val_r_squared: 0.9934 - lr:
1.0000e-05
Epoch 898/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.0997 - val_loss: 3.1268e-05 - val_r_squared: 0.9938 - lr:
1.0000e-05
Epoch 899/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.1883 - val_loss: 1.6112e-04 - val_r_squared: 0.9671 - lr:
1.0000e-05
Epoch 900/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.1726 - val_loss: 4.1916e-05 - val_r_squared: 0.9920 - lr:
1.0000e-05
Epoch 901/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: 0.0391 - val_loss: 1.2350e-05 - val_r_squared: 0.9979 - lr:
1.0000e-05
Epoch 902/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.1149 - val_loss: 4.1402e-05 - val_r_squared: 0.9918 - lr:
1.0000e-05
Epoch 903/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: -0.0252 - val_loss: 4.8977e-05 - val_r_squared: 0.9907 - lr:
1.0000e-05
Epoch 904/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0054 -
r_squared: -0.1713 - val_loss: 7.0895e-05 - val_r_squared: 0.9862 - lr:
1.0000e-05
Epoch 905/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: 0.0042 - val_loss: 8.6298e-05 - val_r_squared: 0.9838 - lr:
1.0000e-05
Epoch 906/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0052 -
r_squared: -0.2303 - val_loss: 8.9391e-05 - val_r_squared: 0.9843 - lr:
1.0000e-05
Epoch 907/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0039 -
r_squared: 0.0259 - val_loss: 1.3399e-05 - val_r_squared: 0.9973 - lr:
1.0000e-05
Epoch 908/1000
```

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13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: 0.0239 - val_loss: 2.9842e-05 - val_r_squared: 0.9945 - lr:
1.0000e-05
Epoch 909/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0047 -
r_squared: -0.1165 - val_loss: 1.8384e-05 - val_r_squared: 0.9966 - lr:
1.0000e-05
Epoch 910/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0042 -
r_squared: -0.1543 - val_loss: 6.3024e-06 - val_r_squared: 0.9986 - lr:
1.0000e-05
Epoch 911/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0039 -
r_squared: 0.1203 - val_loss: 4.5739e-05 - val_r_squared: 0.9896 - lr:
1.0000e-05
Epoch 912/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0045 -
r_squared: -0.2025 - val_loss: 4.9897e-06 - val_r_squared: 0.9990 - lr:
1.0000e-05
Epoch 913/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0046 -
r_squared: -0.0670 - val_loss: 1.3363e-04 - val_r_squared: 0.9725 - lr:
1.0000e-05
Epoch 914/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0039 -
r_squared: 0.0748 - val_loss: 3.6385e-05 - val_r_squared: 0.9929 - lr:
1.0000e-05
Epoch 915/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0040 -
r_squared: 0.1099 - val_loss: 3.6628e-06 - val_r_squared: 0.9993 - lr:
1.0000e-05
Epoch 916/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0051 -
r_squared: -0.2054 - val_loss: 1.1937e-05 - val_r_squared: 0.9979 - lr:
1.0000e-05
Epoch 917/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0049 -
r_squared: -0.1118 - val_loss: 4.3507e-05 - val_r_squared: 0.9902 - lr:
1.0000e-05
Epoch 918/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.2894 - val_loss: 4.2037e-06 - val_r_squared: 0.9991 - lr:
1.0000e-05
Epoch 919/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.1904 - val_loss: 1.8949e-05 - val_r_squared: 0.9967 - lr:
1.0000e-05
Epoch 920/1000
```

```
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.0997 - val_loss: 1.0137e-05 - val_r_squared: 0.9982 - lr:
1.0000e-05
Epoch 921/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.0523 - val_loss: 6.4717e-05 - val_r_squared: 0.9863 - lr:
1.0000e-05
Epoch 922/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0050 -
r_squared: -0.1558 - val_loss: 3.6398e-06 - val_r_squared: 0.9994 - lr:
1.0000e-05
Epoch 923/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.1985 - val_loss: 5.7373e-05 - val_r_squared: 0.9887 - lr:
1.0000e-05
Epoch 924/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0037 -
r_squared: 0.0703 - val_loss: 5.0518e-06 - val_r_squared: 0.9991 - lr:
1.0000e-05
Epoch 925/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0039 -
r_squared: -0.0566 - val_loss: 6.6954e-05 - val_r_squared: 0.9881 - lr:
1.0000e-05
Epoch 926/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0041 -
r_squared: 0.0380 - val_loss: 2.1222e-05 - val_r_squared: 0.9963 - lr:
1.0000e-05
Epoch 927/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0039 -
r_squared: 0.0716 - val_loss: 9.9285e-06 - val_r_squared: 0.9981 - lr:
1.0000e-05
Epoch 928/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0043 -
r_squared: -0.0766 - val_loss: 5.1070e-06 - val_r_squared: 0.9991 - lr:
1.0000e-05
Epoch 929/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0044 -
r_squared: -0.0323 - val_loss: 2.6682e-05 - val_r_squared: 0.9952 - lr:
1.0000e-05
Epoch 930/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0055 -
r_squared: -0.1952 - val_loss: 3.1685e-05 - val_r_squared: 0.9942 - lr:
1.0000e-05
Epoch 931/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0048 -
r_squared: -0.1019 - val_loss: 7.3722e-05 - val_r_squared: 0.9864 - lr:
1.0000e-05
Epoch 932/1000
```

```
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: -0.0184 - val_loss: 8.4714e-06 - val_r_squared: 0.9984 - lr:
1.0000e-05
Epoch 933/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: -0.0533 - val_loss: 1.3437e-05 - val_r_squared: 0.9975 - lr:
1.0000e-05
Epoch 934/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: 0.0131 - val_loss: 2.6766e-05 - val_r_squared: 0.9951 - lr:
1.0000e-05
Epoch 935/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0037 -
r_squared: 0.1126 - val_loss: 1.0981e-04 - val_r_squared: 0.9792 - lr:
1.0000e-05
Epoch 936/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0051 -
r_squared: -0.3358 - val_loss: 9.1198e-05 - val_r_squared: 0.9796 - lr:
1.0000e-05
Epoch 937/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0043 -
r_squared: 0.0040 - val_loss: 1.1435e-04 - val_r_squared: 0.9765 - lr:
1.0000e-05
Epoch 938/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0043 -
r_squared: -0.0185 - val_loss: 9.9151e-05 - val_r_squared: 0.9829 - lr:
1.0000e-05
Epoch 939/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0040 -
r_squared: 0.1238 - val_loss: 8.4640e-05 - val_r_squared: 0.9846 - lr:
1.0000e-05
Epoch 940/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0048 -
r_squared: -0.1759 - val_loss: 4.3661e-05 - val_r_squared: 0.9909 - lr:
1.0000e-05
Epoch 941/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0046 -
r_squared: -0.2298 - val_loss: 8.1338e-05 - val_r_squared: 0.9836 - lr:
1.0000e-05
Epoch 942/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: 0.0057 - val_loss: 2.2778e-05 - val_r_squared: 0.9957 - lr:
1.0000e-05
Epoch 943/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.0751 - val_loss: 2.4546e-05 - val_r_squared: 0.9951 - lr:
1.0000e-05
Epoch 944/1000
```

```
13/13 [==============================] - 0s 25ms/step - loss: 0.0050 -
r_squared: -0.2313 - val_loss: 7.5395e-06 - val_r_squared: 0.9987 - lr:
1.0000e-05
Epoch 945/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0048 -
r_squared: -0.2932 - val_loss: 9.0181e-05 - val_r_squared: 0.9796 - lr:
1.0000e-05
Epoch 946/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0043 -
r_squared: -0.2095 - val_loss: 5.4685e-05 - val_r_squared: 0.9885 - lr:
1.0000e-05
Epoch 947/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0040 -
r_squared: 0.0737 - val_loss: 2.6760e-05 - val_r_squared: 0.9950 - lr:
1.0000e-05
Epoch 948/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0045 -
r_squared: -0.0043 - val_loss: 3.9864e-05 - val_r_squared: 0.9922 - lr:
1.0000e-05
Epoch 949/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0051 -
r_squared: -0.1953 - val_loss: 1.0771e-04 - val_r_squared: 0.9780 - lr:
1.0000e-05
Epoch 950/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0049 -
r_squared: -0.1759 - val_loss: 2.3802e-05 - val_r_squared: 0.9944 - lr:
1.0000e-05
Epoch 951/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0045 -
r_squared: -0.0165 - val_loss: 2.8293e-05 - val_r_squared: 0.9950 - lr:
1.0000e-05
Epoch 952/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0056 -
r_squared: -0.3664 - val_loss: 2.6782e-04 - val_r_squared: 0.9499 - lr:
1.0000e-05
Epoch 953/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.1071 - val_loss: 3.2275e-05 - val_r_squared: 0.9926 - lr:
1.0000e-05
Epoch 954/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0035 -
r_squared: -0.1965 - val_loss: 4.2090e-06 - val_r_squared: 0.9992 - lr:
1.0000e-05
Epoch 955/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0048 -
r_squared: -0.1919 - val_loss: 5.6442e-05 - val_r_squared: 0.9892 - lr:
1.0000e-05
Epoch 956/1000
```

```
13/13 [==============================] - 0s 24ms/step - loss: 0.0039 -
r_squared: 0.0474 - val_loss: 5.4392e-06 - val_r_squared: 0.9991 - lr:
1.0000e-05
Epoch 957/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0049 -
r_squared: -1.0200 - val_loss: 1.1812e-05 - val_r_squared: 0.9977 - lr:
1.0000e-05
Epoch 958/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.1121 - val_loss: 2.6381e-06 - val_r_squared: 0.9994 - lr:
1.0000e-05
Epoch 959/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0041 -
r_squared: 0.0535 - val_loss: 3.7818e-06 - val_r_squared: 0.9992 - lr:
1.0000e-05
Epoch 960/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0038 -
r_squared: 0.0843 - val_loss: 2.0971e-05 - val_r_squared: 0.9962 - lr:
1.0000e-05
Epoch 961/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0050 -
r_squared: -0.1110 - val_loss: 6.5393e-05 - val_r_squared: 0.9875 - lr:
1.0000e-05
Epoch 962/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.0200 - val_loss: 8.1318e-05 - val_r_squared: 0.9842 - lr:
1.0000e-05
Epoch 963/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0038 -
r_squared: 0.0900 - val_loss: 1.1515e-05 - val_r_squared: 0.9978 - lr:
1.0000e-05
Epoch 964/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.0379 - val_loss: 5.2279e-05 - val_r_squared: 0.9910 - lr:
1.0000e-05
Epoch 965/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.1501 - val_loss: 3.9465e-05 - val_r_squared: 0.9920 - lr:
1.0000e-05
Epoch 966/1000
13/13 [==============================] - 0s 22ms/step - loss: 0.0040 -
r_squared: 0.0654 - val_loss: 7.1887e-05 - val_r_squared: 0.9860 - lr:
1.0000e-05
Epoch 967/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0043 -
r_squared: -0.2536 - val_loss: 3.1537e-06 - val_r_squared: 0.9994 - lr:
1.0000e-05
Epoch 968/1000
```

```
13/13 [==============================] - 0s 24ms/step - loss: 0.0041 -
r_squared: -0.0077 - val_loss: 7.1885e-05 - val_r_squared: 0.9846 - lr:
1.0000e-05
Epoch 969/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0043 -
r_squared: 0.0539 - val_loss: 2.6556e-05 - val_r_squared: 0.9952 - lr:
1.0000e-05
Epoch 970/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.1344 - val_loss: 2.5264e-04 - val_r_squared: 0.9513 - lr:
1.0000e-05
Epoch 971/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0045 -
r_squared: -0.0460 - val_loss: 1.8169e-05 - val_r_squared: 0.9957 - lr:
1.0000e-05
Epoch 972/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0052 -
r_squared: -0.1592 - val_loss: 2.8298e-05 - val_r_squared: 0.9934 - lr:
1.0000e-05
Epoch 973/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0046 -
r_squared: -0.1303 - val_loss: 1.2823e-05 - val_r_squared: 0.9976 - lr:
1.0000e-05
Epoch 974/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0046 -
r_squared: -0.1031 - val_loss: 2.4963e-05 - val_r_squared: 0.9950 - lr:
1.0000e-05
Epoch 975/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0054 -
r_squared: -0.2913 - val_loss: 4.6954e-05 - val_r_squared: 0.9909 - lr:
1.0000e-05
Epoch 976/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.3368 - val_loss: 3.4945e-06 - val_r_squared: 0.9992 - lr:
1.0000e-05
Epoch 977/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0040 -
r_squared: -0.0814 - val_loss: 2.9597e-05 - val_r_squared: 0.9945 - lr:
1.0000e-05
Epoch 978/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0045 -
r_squared: 0.0371 - val_loss: 5.7386e-05 - val_r_squared: 0.9901 - lr:
1.0000e-05
Epoch 979/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0043 -
r_squared: -0.0435 - val_loss: 5.9917e-05 - val_r_squared: 0.9893 - lr:
1.0000e-05
Epoch 980/1000
```

```
13/13 [==============================] - 0s 23ms/step - loss: 0.0042 -
r_squared: 0.0867 - val_loss: 3.2257e-05 - val_r_squared: 0.9937 - lr:
1.0000e-05
Epoch 981/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0054 -
r_squared: -0.2820 - val_loss: 1.0354e-04 - val_r_squared: 0.9812 - lr:
1.0000e-05
Epoch 982/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0054 -
r_squared: -1.1136 - val_loss: 1.1155e-05 - val_r_squared: 0.9979 - lr:
1.0000e-05
Epoch 983/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0038 -
r_squared: 0.0564 - val_loss: 1.0104e-04 - val_r_squared: 0.9779 - lr:
1.0000e-05
Epoch 984/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.0970 - val_loss: 6.1307e-05 - val_r_squared: 0.9887 - lr:
1.0000e-05
Epoch 985/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0049 -
r_squared: -0.1729 - val_loss: 7.6114e-06 - val_r_squared: 0.9986 - lr:
1.0000e-05
Epoch 986/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0049 -
r_squared: -0.1459 - val_loss: 4.8982e-05 - val_r_squared: 0.9900 - lr:
1.0000e-05
Epoch 987/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0035 -
r_squared: 0.1920 - val_loss: 4.2377e-06 - val_r_squared: 0.9993 - lr:
1.0000e-05
Epoch 988/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0047 -
r_squared: -0.1075 - val_loss: 3.1714e-06 - val_r_squared: 0.9993 - lr:
1.0000e-05
Epoch 989/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0040 -
r_squared: 0.0431 - val_loss: 1.3715e-05 - val_r_squared: 0.9967 - lr:
1.0000e-05
Epoch 990/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0045 -
r_squared: -0.2881 - val_loss: 5.9722e-05 - val_r_squared: 0.9874 - lr:
1.0000e-05
Epoch 991/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0046 -
r_squared: 0.0280 - val_loss: 2.5258e-05 - val_r_squared: 0.9956 - lr:
1.0000e-05
Epoch 992/1000
```

```
13/13 [==============================] - 0s 24ms/step - loss: 0.0044 -
r_squared: 0.0486 - val_loss: 6.7426e-05 - val_r_squared: 0.9866 - lr:
1.0000e-05
Epoch 993/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0042 -
r_squared: 0.0184 - val_loss: 1.3353e-04 - val_r_squared: 0.9746 - lr:
1.0000e-05
Epoch 994/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0048 -
r_squared: -0.2003 - val_loss: 2.7960e-05 - val_r_squared: 0.9951 - lr:
1.0000e-05
Epoch 995/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0041 -
r_squared: 0.0047 - val_loss: 5.6099e-05 - val_r_squared: 0.9894 - lr:
1.0000e-05
Epoch 996/1000
13/13 [==============================] - 0s 23ms/step - loss: 0.0044 -
r_squared: -0.0043 - val_loss: 8.0780e-06 - val_r_squared: 0.9985 - lr:
1.0000e-05
Epoch 997/1000
13/13 [==============================] - 0s 25ms/step - loss: 0.0042 -
r_squared: 0.0908 - val_loss: 2.2404e-05 - val_r_squared: 0.9949 - lr:
1.0000e-05
Epoch 998/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0037 -
r_squared: 0.0628 - val_loss: 1.2871e-05 - val_r_squared: 0.9977 - lr:
1.0000e-05
Epoch 999/1000
13/13 [==============================] - 0s 26ms/step - loss: 0.0048 -
r_squared: -0.2226 - val_loss: 1.1867e-05 - val_r_squared: 0.9977 - lr:
1.0000e-05
Epoch 1000/1000
13/13 [==============================] - 0s 24ms/step - loss: 0.0042 -
r_squared: 0.0659 - val_loss: 6.6281e-06 - val_r_squared: 0.9987 - lr:
1.0000e-05
```

[49]:
```python
model.save_weights('model_stocks.h5')
model.load_weights('model_stocks.h5')
```

[29]:
```python
y_pred = model.predict(X_test)
print(y_pred)
df = pd.DataFrame({'Actual': y_test.flatten(), 'Predicted': y_pred.flatten()})
df.to_csv('predictions.csv', index=False)
```

```
2/2 [==============================] - 0s 16ms/step
[[19299.287]
 [17714.102]
 [19368.686]
```

```
[19315.873]
[19533.041]
[21464.895]
[21445.324]
[21348.828]
[17972.695]
[19990.36 ]
[21916.826]
[21963.932]
[21860.283]
[22312.87 ]
[19708.47 ]
[22291.262]
[21218.273]
[18188.377]
[21572.197]
[18217.21 ]
[22532.785]
[18319.281]
[19499.547]
[19598.736]
[21494.994]
[18666.479]
[19267.555]
[18059.234]
[18513.758]
[19426.066]
[21647.787]
[18406.4  ]
[19313.607]
[21810.54 ]
[18276.703]
[19555.596]
[18189.53 ]
[21522.84 ]
[21412.285]
[20639.318]
[19426.027]
[19351.762]
[19907.994]
[21431.645]
[22260.256]
[18156.232]
[19516.355]
[19530.646]
[21198.879]
[18494.525]]
```

```
[50]: plt.figure(figsize=(12, 4))
```

```
[50]: <Figure size 1200x400 with 0 Axes>

      <Figure size 1200x400 with 0 Axes>
```

```
[51]: # Predicted vs Actual graph
      plt.subplot(1, 1, 1)
      plt.plot(y_test, color='blue', label='Actual')
      plt.plot(y_pred, color='red', label='Predicted')
      plt.title('Predicted vs Actual')
      plt.legend()
```

```
[51]: <matplotlib.legend.Legend at 0x202978aa3d0>
```
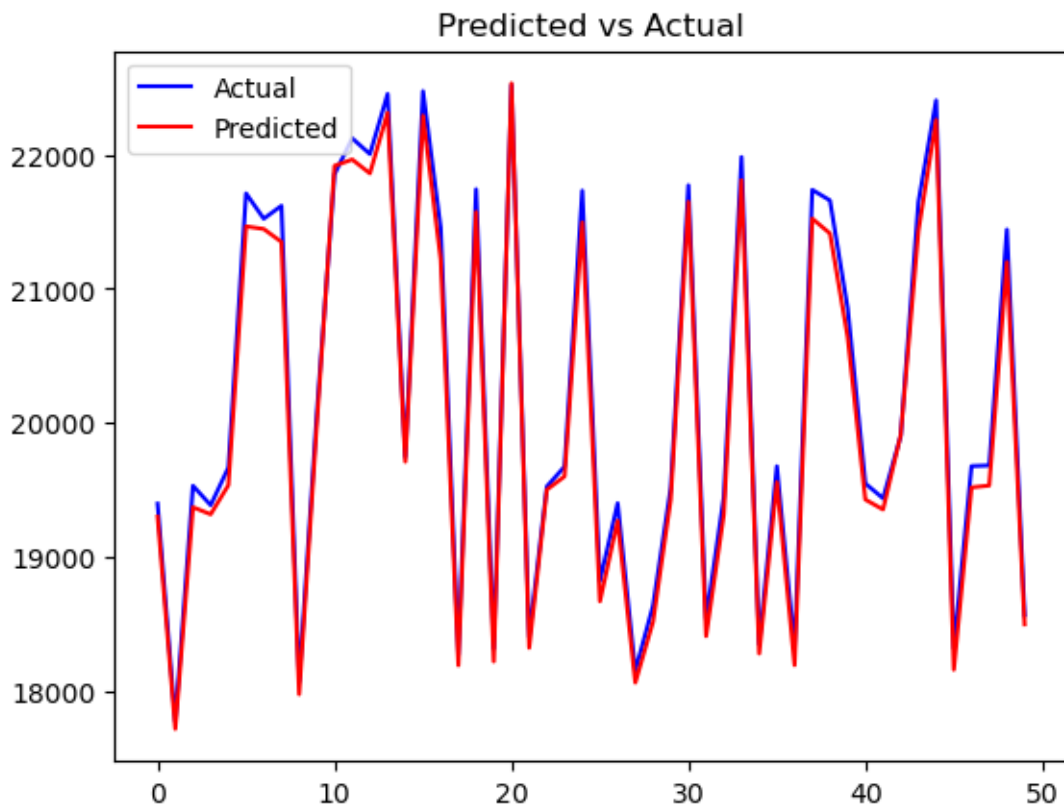


```
[55]: plt.figure(figsize=(15, 10))

      # Assuming y_test and y_pred are numpy arrays
      for i in range(1):
          plt.subplot(3, 1, i+1)
```

```python
    # Plot histogram for Actual values of output i
    plt.hist(y_test[:, i], bins=30, alpha=0.5, color='blue', label='Actual')

    # Plot histogram for Predicted values of output i
    plt.hist(y_pred[:, i], bins=30, alpha=0.5, color='red', label='Predicted')

    plt.title(f'Actual vs Predicted Histogram for Output {i+1}')
    plt.legend()

plt.tight_layout()
plt.show()
```
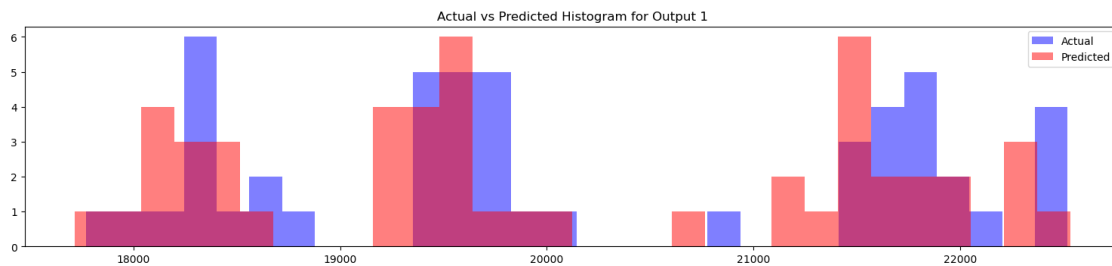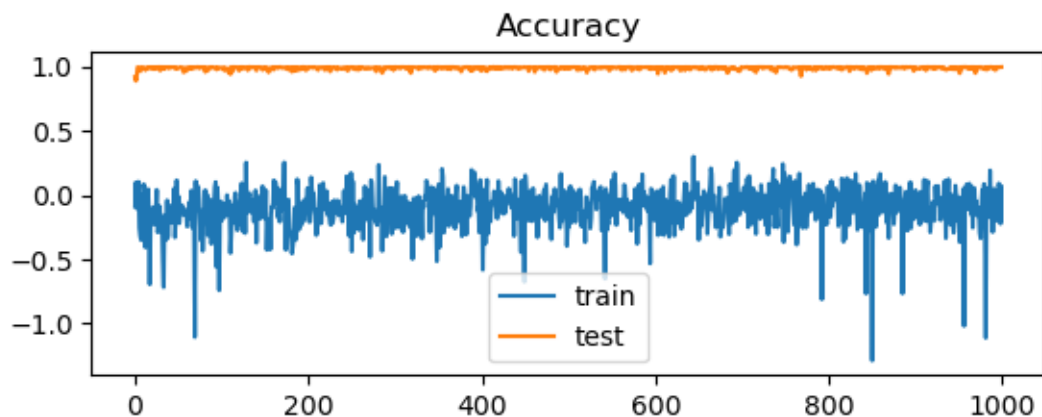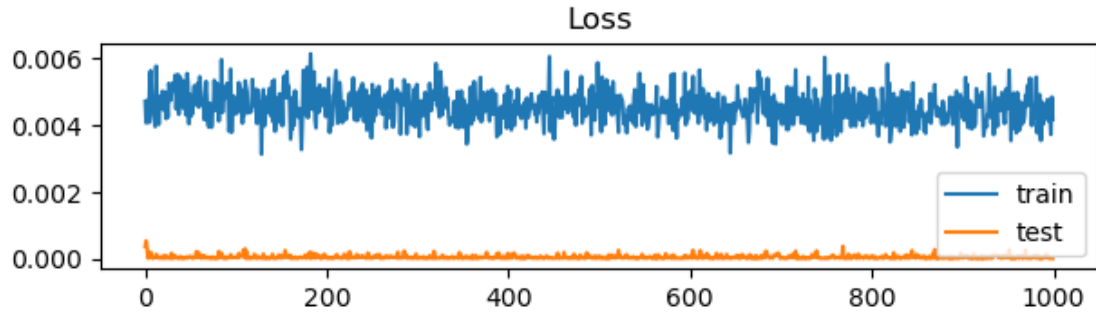


```python
[56]:  # Accuracy graph
       plt.subplot(2, 1, 1)
       plt.plot(history.history['r_squared'], label='train')
       plt.plot(history.history['val_r_squared'], label='test')
       plt.title('Accuracy')
       plt.legend()
```

[56]: <matplotlib.legend.Legend at 0x202aee3c4d0>

```
[57]: # Loss graph
      plt.subplot(3, 1, 2)
      plt.plot(history.history['loss'], label='train')
      plt.plot(history.history['val_loss'], label='test')
      plt.title('Loss')
      plt.legend()
      plt.tight_layout()
      plt.show()
```


[ ]:

[ ]: