Part B

Repeat Part A but use a normalized version of the data. Recall that one way to normalize the data is by subtracting the mean from the individual predictors and dividing by the standard deviation.

Normalize the data

In [1]:
```
import keras
import numpy as np
import pandas as pd
from sklearn.model_selection import train_test_split
from sklearn.metrics import mean_squared_error
```

In [2]:
```
# Read the data
concrete_data = pd.read_csv("concrete_data.csv")
concrete_data
```

Out[2]:

	Cement	Blast Furnace Slag	Fly Ash	Water	Superplasticizer	Coarse Aggregate	Fine Aggregate	Age	Stre
0	540.0	0.0	0.0	162.0	2.5	1040.0	676.0	28	
1	540.0	0.0	0.0	162.0	2.5	1055.0	676.0	28	
2	332.5	142.5	0.0	228.0	0.0	932.0	594.0	270	
3	332.5	142.5	0.0	228.0	0.0	932.0	594.0	365	
4	198.6	132.4	0.0	192.0	0.0	978.4	825.5	360	
...	...	...	...	...	...	...	...	...	
1025	276.4	116.0	90.3	179.6	8.9	870.1	768.3	28	
1026	322.2	0.0	115.6	196.0	10.4	817.9	813.4	28	
1027	148.5	139.4	108.6	192.7	6.1	892.4	780.0	28	
1028	159.1	186.7	0.0	175.6	11.3	989.6	788.9	28	
1029	260.9	100.5	78.3	200.6	8.6	864.5	761.5	28	

1030 rows × 9 columns

In [3]:
```
concrete_data.head()
```

Out[3]:

	Cement	Blast Furnace Slag	Fly Ash	Water	Superplasticizer	Coarse Aggregate	Fine Aggregate	Age	Strength
0	540.0	0.0	0.0	162.0	2.5	1040.0	676.0	28	79.99
1	540.0	0.0	0.0	162.0	2.5	1055.0	676.0	28	61.89
2	332.5	142.5	0.0	228.0	0.0	932.0	594.0	270	40.27
3	332.5	142.5	0.0	228.0	0.0	932.0	594.0	365	41.05
4	198.6	132.4	0.0	192.0	0.0	978.4	825.5	360	44.30

In [4]:
```
# Size of the data
concrete_data.shape
```

Out[4]:
```
(1030, 9)
```

In [5]:
```
concrete_data.describe()
```

Out[5]:

	Cement	Blast Furnace Slag	Fly Ash	Water	Superplasticizer	Coars Aggregat
count	1030.000000	1030.000000	1030.000000	1030.000000	1030.000000	1030.00000
mean	281.167864	73.895825	54.188350	181.567282	6.204660	972.91893
std	104.506364	86.279342	63.997004	21.354219	5.973841	77.75395
min	102.000000	0.000000	0.000000	121.800000	0.000000	801.00000
25%	192.375000	0.000000	0.000000	164.900000	0.000000	932.00000
50%	272.900000	22.000000	0.000000	185.000000	6.400000	968.00000
75%	350.000000	142.950000	118.300000	192.000000	10.200000	1029.40000
max	540.000000	359.400000	200.100000	247.000000	32.200000	1145.00000

In [6]:
```
# Sum of the null values
concrete_data.isnull().sum()
```

Out[6]:
```
Cement                0
Blast Furnace Slag    0
Fly Ash               0
Water                 0
Superplasticizer      0
Coarse Aggregate      0
Fine Aggregate        0
Age                   0
Strength              0
dtype: int64
```

Split data into predictors and target

In [9]:
```
concrete_data_columns = concrete_data.columns

# all columns except Strength
predictors = concrete_data[concrete_data_columns[concrete_data_columns
                                                 

# Strength column
target = concrete_data['Strength']
```

In [13]:
```
predictors.head()
```

Out[13]:

	Cement	Blast Furnace Slag	Fly Ash	Water	Superplasticizer	Coarse Aggregate	Fine Aggregate	Age
0	540.0	0.0	0.0	162.0	2.5	1040.0	676.0	28
1	540.0	0.0	0.0	162.0	2.5	1055.0	676.0	28
2	332.5	142.5	0.0	228.0	0.0	932.0	594.0	270
3	332.5	142.5	0.0	228.0	0.0	932.0	594.0	365
4	198.6	132.4	0.0	192.0	0.0	978.4	825.5	360

In [14]:
```
target.head()
```

Out[14]:
```
0    79.99
1    61.89
2    40.27
3    41.05
4    44.30
Name: Strength, dtype: float64
```

In [15]:
```
predictors_norm = (predictors - predictors.mean()) / predictors.std()
predictors_norm.head()
```

Out[15]:

	Cement	Blast Furnace Slag	Fly Ash	Water	Superplasticizer	Coarse Aggregate	Fine Aggregate	
0	2.476712	-0.856472	-0.846733	-0.916319	-0.620147	0.862735	-1.217079	-0
1	2.476712	-0.856472	-0.846733	-0.916319	-0.620147	1.055651	-1.217079	-0
2	0.491187	0.795140	-0.846733	2.174405	-1.038638	-0.526262	-2.239829	3
3	0.491187	0.795140	-0.846733	2.174405	-1.038638	-0.526262	-2.239829	5
4	-0.790075	0.678079	-0.846733	0.488555	-1.038638	0.070492	0.647569	4

In [17]:
```
# number of predictors
n_cols = predictors_norm.shape[1]
n_cols
```

Out[17]:
```
8
```

Build a Neural Network

In [18]:
```
from keras.models import Sequential
from keras.layers import Dense
from keras import backend as K
```

In [19]:
```
# define regression model
def regression_model():
    # create model
    model = Sequential()
    model.add(Dense(10, activation='relu', input_shape=(n_cols,)))
    model.add(Dense(1))

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

Train and Test the network

In [20]:
```
# build the model
model = regression_model()
```

```
C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

In [21]:

```
# fit the model
model.fit(predictors_norm, target, validation_split=0.3, epochs=50, ver
```

```
Epoch 1/50
23/23 - 1s - 29ms/step - loss: 1687.2930 - val_loss: 1222.6021
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1667.5931 - val_loss: 1210.9540
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1648.2905 - val_loss: 1199.3870
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1628.6233 - val_loss: 1187.4524
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1608.8865 - val_loss: 1175.3245
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1588.2588 - val_loss: 1162.8311
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1567.3783 - val_loss: 1149.9335
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1545.1694 - val_loss: 1136.5758
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1521.9469 - val_loss: 1122.4081
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1497.4377 - val_loss: 1107.7015
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1471.6444 - val_loss: 1092.2318
Epoch 12/50
23/23 - 0s - 5ms/step - loss: 1443.9396 - val_loss: 1075.8788
Epoch 13/50
23/23 - 0s - 5ms/step - loss: 1414.6565 - val_loss: 1058.8799
Epoch 14/50
23/23 - 0s - 7ms/step - loss: 1383.7173 - val_loss: 1040.9418
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1351.1292 - val_loss: 1022.7708
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1316.8353 - val_loss: 1003.5204
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1281.1802 - val_loss: 983.7615
Epoch 18/50
23/23 - 0s - 5ms/step - loss: 1244.5603 - val_loss: 963.4169
Epoch 19/50
23/23 - 0s - 5ms/step - loss: 1206.5579 - val_loss: 942.2651
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1167.7308 - val_loss: 921.1577
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1128.4016 - val_loss: 899.3987
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1088.7427 - val_loss: 877.0988
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1048.4281 - val_loss: 855.4470
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1008.9992 - val_loss: 832.2946
Epoch 25/50
23/23 - 0s - 8ms/step - loss: 969.4636 - val_loss: 810.5886
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 930.5959 - val_loss: 788.5229
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 892.5125 - val_loss: 766.2831
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 854.6508 - val_loss: 743.9662
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 818.0240 - val_loss: 722.4180
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 782.7289 - val_loss: 700.4412
Epoch 31/50
```

```
23/23 - 0s - 4ms/step - loss: 748.0585 - val_loss: 678.2352
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 714.7049 - val_loss: 657.7811
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 682.9636 - val_loss: 637.1203
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 652.3029 - val_loss: 617.4987
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 623.3281 - val_loss: 598.0534
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 595.3621 - val_loss: 578.5069
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 568.7936 - val_loss: 560.0037
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 543.7593 - val_loss: 541.6242
Epoch 39/50
23/23 - 0s - 5ms/step - loss: 519.8665 - val_loss: 524.7191
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 497.6261 - val_loss: 508.0446
Epoch 41/50
23/23 - 0s - 5ms/step - loss: 476.5786 - val_loss: 492.0036
Epoch 42/50
23/23 - 0s - 6ms/step - loss: 456.7609 - val_loss: 476.6475
Epoch 43/50
23/23 - 0s - 8ms/step - loss: 438.3021 - val_loss: 461.6062
Epoch 44/50
23/23 - 0s - 6ms/step - loss: 420.7292 - val_loss: 447.4550
Epoch 45/50
23/23 - 0s - 7ms/step - loss: 404.6440 - val_loss: 433.4830
Epoch 46/50
23/23 - 0s - 5ms/step - loss: 389.0769 - val_loss: 420.5504
Epoch 47/50
23/23 - 0s - 6ms/step - loss: 374.9558 - val_loss: 408.0150
Epoch 48/50
23/23 - 0s - 5ms/step - loss: 361.6743 - val_loss: 396.3968
Epoch 49/50
23/23 - 0s - 8ms/step - loss: 349.1110 - val_loss: 385.3998
Epoch 50/50
23/23 - 0s - 7ms/step - loss: 337.8737 - val_loss: 374.7487
```

Out[21]: <keras.src.callbacks.history.History at 0x20e24522e00>

In [22]:

```
mean = []

for i in range(50):
    def regression_model():

        concrete_data_columns = concrete_data.columns
        # all columns except Strength
        predictors = concrete_data[concrete_data_columns[concrete_data_
        # Strength column
        target = concrete_data['Strength']

        predictors_norm = (predictors - predictors.mean()) / predictors
        predictors_norm.head()

        # number of predictors
        n_cols = predictors_norm.shape[1]

        # create model
        model = Sequential()
        model.add(Dense(10, activation='relu', input_shape=(n_cols,)))
        model.add(Dense(1))

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

    model = regression_model()
    model.fit(predictors_norm, target, validation_split=0.3, epochs=50,

    # Calculate mse
    y_pred = model.predict(predictors_norm)
    mse = mean_squared_error(y_pred, target)
    print("Mean Squared Error is: ",mse)
    mean.append(mse)

print(mean)
```

```
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 26ms/step - loss: 1791.9117 - val_loss: 1274.3723
Epoch 2/50
23/23 - 0s - 3ms/step - loss: 1774.3901 - val_loss: 1262.4584
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1757.6643 - val_loss: 1250.7988
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1741.7850 - val_loss: 1238.9768
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1726.0859 - val_loss: 1227.6230
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1710.4508 - val_loss: 1216.1400
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1694.7260 - val_loss: 1204.4662
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1678.6580 - val_loss: 1192.6935
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1662.2876 - val_loss: 1180.7545
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1645.3098 - val_loss: 1168.5726
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1627.7032 - val_loss: 1156.0962
Epoch 12/50
23/23 - 0s - 5ms/step - loss: 1609.6377 - val_loss: 1143.1349
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1591.0836 - val_loss: 1129.9000
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1571.5566 - val_loss: 1116.6641
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1551.6028 - val_loss: 1102.9821
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1530.7289 - val_loss: 1089.3488
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1509.6407 - val_loss: 1074.7598
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1487.5698 - val_loss: 1060.3229
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1465.1316 - val_loss: 1045.3752
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1441.8770 - val_loss: 1030.5190
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1418.2996 - val_loss: 1014.9540
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1393.7985 - val_loss: 999.4974
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1368.9114 - val_loss: 983.9323
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1343.3263 - val_loss: 967.9965
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1317.5045 - val_loss: 952.0936
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1291.0342 - val_loss: 936.0511
Epoch 27/50
23/23 - 0s - 5ms/step - loss: 1264.0361 - val_loss: 919.6746
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 1237.1638 - val_loss: 903.2783
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 1209.6990 - val_loss: 886.7012
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 1182.4561 - val_loss: 870.3324
Epoch 31/50
23/23 - 0s - 6ms/step - loss: 1154.8112 - val_loss: 853.7048
```

```
Epoch 32/50
23/23 - 0s - 8ms/step - loss: 1127.2656 - val_loss: 836.8391
Epoch 33/50
23/23 - 0s - 7ms/step - loss: 1099.3878 - val_loss: 820.3222
Epoch 34/50
23/23 - 0s - 3ms/step - loss: 1071.6096 - val_loss: 803.5582
Epoch 35/50
23/23 - 0s - 3ms/step - loss: 1043.9359 - val_loss: 786.8453
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 1016.0596 - val_loss: 770.0611
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 988.6288 - val_loss: 752.9179
Epoch 38/50
23/23 - 0s - 6ms/step - loss: 960.9158 - val_loss: 736.2467
Epoch 39/50
23/23 - 0s - 6ms/step - loss: 933.7946 - val_loss: 719.4159
Epoch 40/50
23/23 - 0s - 5ms/step - loss: 906.5669 - val_loss: 702.1556
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 879.9494 - val_loss: 684.8571
Epoch 42/50
23/23 - 0s - 5ms/step - loss: 852.9189 - val_loss: 668.1237
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 826.7233 - val_loss: 650.9099
Epoch 44/50
23/23 - 0s - 6ms/step - loss: 800.1392 - val_loss: 634.2710
Epoch 45/50
23/23 - 0s - 8ms/step - loss: 774.6506 - val_loss: 617.1000
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 748.9674 - val_loss: 599.9513
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 724.2296 - val_loss: 583.1176
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 699.8209 - val_loss: 566.4860
Epoch 49/50
23/23 - 0s - 6ms/step - loss: 675.7831 - val_loss: 550.3010
Epoch 50/50
23/23 - 0s - 8ms/step - loss: 652.7596 - val_loss: 534.0242
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 3ms/step
Mean Squared Error is:  608.1987796014439
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 53ms/step - loss: 1723.6224 - val_loss: 1212.8270
Epoch 2/50
23/23 - 0s - 5ms/step - loss: 1702.9989 - val_loss: 1198.4060
Epoch 3/50
23/23 - 0s - 5ms/step - loss: 1682.3990 - val_loss: 1183.8752
Epoch 4/50
23/23 - 0s - 8ms/step - loss: 1661.4879 - val_loss: 1169.0194
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1640.5177 - val_loss: 1153.8431
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1619.1320 - val_loss: 1137.9498
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1597.2035 - val_loss: 1121.6367
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1575.0880 - val_loss: 1105.5216
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1552.4490 - val_loss: 1088.7759
Epoch 10/50
23/23 - 0s - 5ms/step - loss: 1529.0499 - val_loss: 1071.4189
Epoch 11/50
23/23 - 0s - 8ms/step - loss: 1505.4706 - val_loss: 1053.6471
Epoch 12/50
23/23 - 0s - 6ms/step - loss: 1480.6183 - val_loss: 1035.8612
Epoch 13/50
23/23 - 0s - 6ms/step - loss: 1455.4299 - val_loss: 1017.3661
Epoch 14/50
23/23 - 0s - 5ms/step - loss: 1429.5878 - val_loss: 998.5988
Epoch 15/50
23/23 - 0s - 8ms/step - loss: 1403.2587 - val_loss: 979.4003
Epoch 16/50
23/23 - 0s - 5ms/step - loss: 1376.1750 - val_loss: 960.2454
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1348.8337 - val_loss: 940.4161
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1321.0747 - val_loss: 920.7316
Epoch 19/50
23/23 - 0s - 6ms/step - loss: 1292.9259 - val_loss: 900.6940
Epoch 20/50
23/23 - 0s - 5ms/step - loss: 1264.3883 - val_loss: 880.6219
Epoch 21/50
23/23 - 0s - 7ms/step - loss: 1235.4401 - val_loss: 861.0710
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1206.6769 - val_loss: 840.6595
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1177.1901 - val_loss: 820.7758
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1147.7168 - val_loss: 800.8710
Epoch 25/50
23/23 - 0s - 7ms/step - loss: 1118.3809 - val_loss: 781.4011
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1088.9685 - val_loss: 761.4578
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 1059.2316 - val_loss: 742.1393
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 1029.8419 - val_loss: 723.7413
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 1000.7909 - val_loss: 705.1655
Epoch 30/50
23/23 - 0s - 5ms/step - loss: 972.1403 - val_loss: 687.3964
Epoch 31/50
23/23 - 0s - 8ms/step - loss: 943.1306 - val_loss: 670.0152
```

```
Epoch 32/50
23/23 - 0s - 7ms/step - loss: 915.1072 - val_loss: 652.6569
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 886.9962 - val_loss: 636.3192
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 858.8018 - val_loss: 619.9994
Epoch 35/50
23/23 - 0s - 7ms/step - loss: 830.6145 - val_loss: 604.5674
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 803.3503 - val_loss: 588.8672
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 775.7356 - val_loss: 573.9235
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 748.5182 - val_loss: 558.6179
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 720.7670 - val_loss: 544.4577
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 693.2449 - val_loss: 529.4081
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 665.7773 - val_loss: 515.4240
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 639.1593 - val_loss: 501.3689
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 612.5577 - val_loss: 488.0039
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 587.0792 - val_loss: 474.5730
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 561.6203 - val_loss: 462.3888
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 537.7933 - val_loss: 449.8236
Epoch 47/50
23/23 - 0s - 5ms/step - loss: 514.2657 - val_loss: 437.7300
Epoch 48/50
23/23 - 0s - 5ms/step - loss: 491.7180 - val_loss: 426.0126
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 470.1127 - val_loss: 414.9359
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 449.4362 - val_loss: 403.9049
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 1ms/step
Mean Squared Error is:  428.25664497461065
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 29ms/step - loss: 1663.6101 - val_loss: 1198.3741
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1644.5631 - val_loss: 1185.7927
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1625.0782 - val_loss: 1172.9185
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1605.1196 - val_loss: 1159.7490
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1584.4237 - val_loss: 1146.3364
Epoch 6/50
23/23 - 0s - 5ms/step - loss: 1563.0447 - val_loss: 1132.1703
Epoch 7/50
23/23 - 0s - 8ms/step - loss: 1540.6716 - val_loss: 1117.6943
Epoch 8/50
23/23 - 0s - 5ms/step - loss: 1517.3894 - val_loss: 1102.6766
Epoch 9/50
23/23 - 0s - 5ms/step - loss: 1493.0148 - val_loss: 1086.8105
Epoch 10/50
23/23 - 0s - 5ms/step - loss: 1467.1798 - val_loss: 1070.6948
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1440.5315 - val_loss: 1053.3363
Epoch 12/50
23/23 - 0s - 5ms/step - loss: 1412.1554 - val_loss: 1035.9280
Epoch 13/50
23/23 - 0s - 5ms/step - loss: 1383.3112 - val_loss: 1016.7348
Epoch 14/50
23/23 - 0s - 8ms/step - loss: 1352.6349 - val_loss: 997.1586
Epoch 15/50
23/23 - 0s - 7ms/step - loss: 1320.4209 - val_loss: 977.6007
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1287.8282 - val_loss: 956.9781
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1253.7655 - val_loss: 935.0917
Epoch 18/50
23/23 - 0s - 8ms/step - loss: 1219.0214 - val_loss: 912.7798
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1183.5228 - val_loss: 890.6932
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1147.3885 - val_loss: 867.5157
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1111.0360 - val_loss: 844.7281
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1074.0480 - val_loss: 821.3231
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1037.3546 - val_loss: 797.8522
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1000.8005 - val_loss: 774.1025
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 964.3486 - val_loss: 750.5511
Epoch 26/50
23/23 - 0s - 8ms/step - loss: 928.0883 - val_loss: 727.2720
Epoch 27/50
23/23 - 0s - 5ms/step - loss: 892.4872 - val_loss: 704.1348
Epoch 28/50
23/23 - 0s - 8ms/step - loss: 856.7438 - val_loss: 681.1337
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 822.2805 - val_loss: 658.6185
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 788.3734 - val_loss: 636.9028
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 754.3528 - val_loss: 615.6709
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 722.1533 - val_loss: 594.1962
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 688.9810 - val_loss: 574.2537
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 658.2327 - val_loss: 554.6007
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 627.6100 - val_loss: 535.6011
Epoch 36/50
23/23 - 0s - 5ms/step - loss: 598.1038 - val_loss: 517.3502
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 569.8179 - val_loss: 500.0714
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 542.6547 - val_loss: 483.5280
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 517.2791 - val_loss: 467.1894
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 492.6128 - val_loss: 451.8160
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 469.5342 - val_loss: 436.9943
Epoch 42/50
23/23 - 0s - 5ms/step - loss: 447.5757 - val_loss: 423.2347
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 427.5706 - val_loss: 409.7521
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 409.0330 - val_loss: 397.7922
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 391.9122 - val_loss: 385.3893
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 376.2823 - val_loss: 374.3356
Epoch 47/50
23/23 - 0s - 6ms/step - loss: 362.0648 - val_loss: 363.4767
Epoch 48/50
23/23 - 0s - 5ms/step - loss: 348.6100 - val_loss: 353.4860
Epoch 49/50
23/23 - 0s - 8ms/step - loss: 336.7168 - val_loss: 343.3234
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 325.7402 - val_loss: 334.2072
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  324.17975691424954
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 38ms/step - loss: 1744.6234 - val_loss: 1271.9207
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1731.0256 - val_loss: 1261.3488
Epoch 3/50
23/23 - 0s - 5ms/step - loss: 1718.4929 - val_loss: 1250.8912
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1706.1915 - val_loss: 1240.6196
Epoch 5/50
23/23 - 0s - 5ms/step - loss: 1694.0247 - val_loss: 1229.7927
Epoch 6/50
23/23 - 0s - 7ms/step - loss: 1681.5953 - val_loss: 1218.5980
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1668.7297 - val_loss: 1206.6713
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1655.0348 - val_loss: 1194.3367
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1640.5273 - val_loss: 1181.1790
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1624.8868 - val_loss: 1167.1727
Epoch 11/50
23/23 - 0s - 7ms/step - loss: 1608.0690 - val_loss: 1152.4065
Epoch 12/50
23/23 - 0s - 7ms/step - loss: 1590.0912 - val_loss: 1136.9070
Epoch 13/50
23/23 - 0s - 6ms/step - loss: 1570.5033 - val_loss: 1120.6395
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1549.6736 - val_loss: 1103.1350
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1527.0570 - val_loss: 1085.0579
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1502.9015 - val_loss: 1066.7220
Epoch 17/50
23/23 - 0s - 8ms/step - loss: 1477.4979 - val_loss: 1047.7585
Epoch 18/50
23/23 - 0s - 8ms/step - loss: 1450.7793 - val_loss: 1027.5192
Epoch 19/50
23/23 - 0s - 6ms/step - loss: 1422.6255 - val_loss: 1006.9156
Epoch 20/50
23/23 - 0s - 6ms/step - loss: 1393.3442 - val_loss: 986.2169
Epoch 21/50
23/23 - 0s - 7ms/step - loss: 1363.1783 - val_loss: 964.8525
Epoch 22/50
23/23 - 0s - 5ms/step - loss: 1331.8463 - val_loss: 943.0983
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1299.6605 - val_loss: 921.7106
Epoch 24/50
23/23 - 0s - 5ms/step - loss: 1266.2198 - val_loss: 900.0505
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1232.4716 - val_loss: 877.9022
Epoch 26/50
23/23 - 0s - 5ms/step - loss: 1196.5975 - val_loss: 856.1230
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 1160.5350 - val_loss: 833.4748
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 1123.2322 - val_loss: 811.3289
Epoch 29/50
23/23 - 0s - 5ms/step - loss: 1085.2631 - val_loss: 788.5290
Epoch 30/50
23/23 - 0s - 10ms/step - loss: 1046.5582 - val_loss: 766.2415
Epoch 31/50
23/23 - 0s - 5ms/step - loss: 1007.2100 - val_loss: 744.1610
```

```
Epoch 32/50
23/23 - 0s - 8ms/step - loss: 967.6248 - val_loss: 722.1395
Epoch 33/50
23/23 - 0s - 6ms/step - loss: 926.8687 - val_loss: 699.6193
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 885.9532 - val_loss: 678.2180
Epoch 35/50
23/23 - 0s - 9ms/step - loss: 846.2075 - val_loss: 656.4844
Epoch 36/50
23/23 - 0s - 8ms/step - loss: 806.6260 - val_loss: 635.6667
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 767.9136 - val_loss: 615.3776
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 730.7324 - val_loss: 595.1929
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 694.0016 - val_loss: 576.0901
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 658.9542 - val_loss: 557.5901
Epoch 41/50
23/23 - 0s - 7ms/step - loss: 625.3786 - val_loss: 539.0643
Epoch 42/50
23/23 - 0s - 5ms/step - loss: 592.6514 - val_loss: 522.0586
Epoch 43/50
23/23 - 0s - 10ms/step - loss: 562.4214 - val_loss: 504.9153
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 533.3899 - val_loss: 488.6535
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 505.7966 - val_loss: 473.0780
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 480.3740 - val_loss: 458.1771
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 456.3193 - val_loss: 444.5200
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 433.8938 - val_loss: 431.1590
Epoch 49/50
23/23 - 0s - 5ms/step - loss: 413.0307 - val_loss: 418.0999
Epoch 50/50
23/23 - 0s - 5ms/step - loss: 393.9143 - val_loss: 406.0675
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 3ms/step
Mean Squared Error is:  390.97884113071575
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 43ms/step - loss: 1706.7695 - val_loss: 1244.8635
Epoch 2/50
23/23 - 0s - 6ms/step - loss: 1688.0239 - val_loss: 1231.8032
Epoch 3/50
23/23 - 0s - 6ms/step - loss: 1669.8284 - val_loss: 1219.1034
Epoch 4/50
23/23 - 0s - 6ms/step - loss: 1651.7533 - val_loss: 1206.9071
Epoch 5/50
23/23 - 0s - 7ms/step - loss: 1633.9875 - val_loss: 1194.7498
Epoch 6/50
23/23 - 0s - 14ms/step - loss: 1615.9607 - val_loss: 1183.1836
Epoch 7/50
23/23 - 0s - 6ms/step - loss: 1597.8103 - val_loss: 1171.7238
Epoch 8/50
23/23 - 0s - 6ms/step - loss: 1579.3716 - val_loss: 1160.1182
Epoch 9/50
23/23 - 0s - 6ms/step - loss: 1560.3994 - val_loss: 1148.7979
Epoch 10/50
23/23 - 0s - 7ms/step - loss: 1540.8358 - val_loss: 1137.7808
Epoch 11/50
23/23 - 0s - 5ms/step - loss: 1521.0997 - val_loss: 1126.4590
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1500.3530 - val_loss: 1115.2562
Epoch 13/50
23/23 - 0s - 6ms/step - loss: 1479.2365 - val_loss: 1103.8317
Epoch 14/50
23/23 - 0s - 7ms/step - loss: 1457.4847 - val_loss: 1092.3654
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1434.9532 - val_loss: 1080.6631
Epoch 16/50
23/23 - 0s - 8ms/step - loss: 1412.0189 - val_loss: 1068.8527
Epoch 17/50
23/23 - 0s - 6ms/step - loss: 1388.5785 - val_loss: 1056.9675
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1364.2723 - val_loss: 1044.7556
Epoch 19/50
23/23 - 0s - 8ms/step - loss: 1339.8971 - val_loss: 1032.3909
Epoch 20/50
23/23 - 0s - 6ms/step - loss: 1314.7612 - val_loss: 1020.0137
Epoch 21/50
23/23 - 0s - 7ms/step - loss: 1289.0579 - val_loss: 1007.4024
Epoch 22/50
23/23 - 0s - 5ms/step - loss: 1263.1937 - val_loss: 994.1800
Epoch 23/50
23/23 - 0s - 7ms/step - loss: 1236.9226 - val_loss: 981.2543
Epoch 24/50
23/23 - 0s - 5ms/step - loss: 1210.2598 - val_loss: 967.8468
Epoch 25/50
23/23 - 0s - 5ms/step - loss: 1183.3772 - val_loss: 954.1250
Epoch 26/50
23/23 - 0s - 3ms/step - loss: 1155.8854 - val_loss: 940.6168
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 1128.8522 - val_loss: 926.8583
Epoch 28/50
23/23 - 0s - 5ms/step - loss: 1101.5494 - val_loss: 913.0184
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 1074.2821 - val_loss: 899.1233
Epoch 30/50
23/23 - 0s - 5ms/step - loss: 1047.4060 - val_loss: 885.0168
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 1020.0076 - val_loss: 871.1944
```

```
Epoch 32/50
23/23 - 0s - 5ms/step - loss: 993.2345 - val_loss: 857.0397
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 966.9659 - val_loss: 843.1018
Epoch 34/50
23/23 - 0s - 5ms/step - loss: 940.7774 - val_loss: 828.7197
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 915.0301 - val_loss: 814.4504
Epoch 36/50
23/23 - 0s - 5ms/step - loss: 889.5947 - val_loss: 800.3235
Epoch 37/50
23/23 - 0s - 7ms/step - loss: 864.7692 - val_loss: 785.8962
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 840.1765 - val_loss: 771.8171
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 816.1802 - val_loss: 757.7048
Epoch 40/50
23/23 - 0s - 3ms/step - loss: 792.5565 - val_loss: 743.2714
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 769.4313 - val_loss: 729.2517
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 747.0660 - val_loss: 715.1217
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 725.0342 - val_loss: 701.5070
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 704.0587 - val_loss: 687.4365
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 683.3881 - val_loss: 673.4634
Epoch 46/50
23/23 - 0s - 3ms/step - loss: 663.1533 - val_loss: 660.2760
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 644.1444 - val_loss: 647.2173
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 625.2724 - val_loss: 633.4933
Epoch 49/50
23/23 - 0s - 5ms/step - loss: 607.1884 - val_loss: 620.4909
Epoch 50/50
23/23 - 0s - 6ms/step - loss: 589.6601 - val_loss: 607.4132
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 3ms/step
Mean Squared Error is:  588.5380759511352
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 46ms/step - loss: 1735.1733 - val_loss: 1257.8888
Epoch 2/50
23/23 - 0s - 8ms/step - loss: 1716.1638 - val_loss: 1246.0044
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1697.5929 - val_loss: 1234.9456
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1679.4150 - val_loss: 1223.9585
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1661.2013 - val_loss: 1213.1228
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1643.0037 - val_loss: 1202.4312
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1624.1077 - val_loss: 1191.6671
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1604.7458 - val_loss: 1180.8854
Epoch 9/50
23/23 - 0s - 3ms/step - loss: 1584.2953 - val_loss: 1169.7738
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1562.6770 - val_loss: 1158.1838
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1539.7552 - val_loss: 1146.2466
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1515.4307 - val_loss: 1133.7037
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1489.9033 - val_loss: 1121.0199
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1462.7020 - val_loss: 1107.5883
Epoch 15/50
23/23 - 0s - 5ms/step - loss: 1435.1165 - val_loss: 1093.4230
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1405.6720 - val_loss: 1079.0941
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1375.4708 - val_loss: 1064.1061
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1344.1167 - val_loss: 1048.8799
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1312.2875 - val_loss: 1032.8948
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1279.1748 - val_loss: 1016.5750
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1245.7516 - val_loss: 1000.1726
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1211.8229 - val_loss: 983.1379
Epoch 23/50
23/23 - 0s - 6ms/step - loss: 1177.8519 - val_loss: 965.7808
Epoch 24/50
23/23 - 0s - 8ms/step - loss: 1143.1400 - val_loss: 948.3796
Epoch 25/50
23/23 - 0s - 7ms/step - loss: 1108.5826 - val_loss: 930.9391
Epoch 26/50
23/23 - 0s - 6ms/step - loss: 1074.0599 - val_loss: 912.7329
Epoch 27/50
23/23 - 0s - 5ms/step - loss: 1039.0486 - val_loss: 894.9064
Epoch 28/50
23/23 - 0s - 7ms/step - loss: 1004.2839 - val_loss: 876.6249
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 969.7735 - val_loss: 858.7048
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 935.5607 - val_loss: 840.7249
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 902.2271 - val_loss: 822.3608
```

```
Epoch 32/50
23/23 - 0s - 5ms/step - loss: 869.1111 - val_loss: 803.9315
Epoch 33/50
23/23 - 0s - 8ms/step - loss: 836.9219 - val_loss: 785.9031
Epoch 34/50
23/23 - 0s - 7ms/step - loss: 804.9297 - val_loss: 768.0568
Epoch 35/50
23/23 - 0s - 7ms/step - loss: 774.4435 - val_loss: 750.4554
Epoch 36/50
23/23 - 0s - 7ms/step - loss: 744.5308 - val_loss: 732.4740
Epoch 37/50
23/23 - 0s - 7ms/step - loss: 715.7570 - val_loss: 714.6318
Epoch 38/50
23/23 - 0s - 7ms/step - loss: 687.7372 - val_loss: 697.4311
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 661.1838 - val_loss: 680.3632
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 635.4399 - val_loss: 664.0441
Epoch 41/50
23/23 - 0s - 5ms/step - loss: 610.9693 - val_loss: 647.4863
Epoch 42/50
23/23 - 0s - 7ms/step - loss: 587.5160 - val_loss: 630.7504
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 564.7405 - val_loss: 614.7109
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 543.5765 - val_loss: 599.0229
Epoch 45/50
23/23 - 0s - 3ms/step - loss: 522.8872 - val_loss: 583.7795
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 504.2758 - val_loss: 568.5611
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 485.6531 - val_loss: 554.6747
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 468.7147 - val_loss: 540.2995
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 452.5863 - val_loss: 526.5615
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 437.2698 - val_loss: 513.3216
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  454.6485791892008
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 29ms/step - loss: 1752.9517 - val_loss: 1268.1077
Epoch 2/50
23/23 - 0s - 3ms/step - loss: 1734.7463 - val_loss: 1257.2766
Epoch 3/50
23/23 - 0s - 3ms/step - loss: 1717.5120 - val_loss: 1247.0059
Epoch 4/50
23/23 - 0s - 3ms/step - loss: 1700.9967 - val_loss: 1236.9232
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1684.9307 - val_loss: 1227.2468
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1669.1266 - val_loss: 1217.6733
Epoch 7/50
23/23 - 0s - 7ms/step - loss: 1653.2797 - val_loss: 1208.1271
Epoch 8/50
23/23 - 0s - 12ms/step - loss: 1637.3300 - val_loss: 1198.8250
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1621.1857 - val_loss: 1189.4080
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1604.5135 - val_loss: 1179.8759
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1587.5938 - val_loss: 1170.3423
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1570.1832 - val_loss: 1160.7318
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1552.0133 - val_loss: 1150.7533
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1533.2236 - val_loss: 1140.3444
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1513.3606 - val_loss: 1129.7048
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1492.4502 - val_loss: 1118.9187
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1470.7867 - val_loss: 1107.2484
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1447.7606 - val_loss: 1095.2117
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1423.4917 - val_loss: 1082.4659
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1398.2322 - val_loss: 1068.7236
Epoch 21/50
23/23 - 0s - 5ms/step - loss: 1371.2798 - val_loss: 1054.9946
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1343.3026 - val_loss: 1040.6146
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1314.6901 - val_loss: 1025.0018
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1284.2001 - val_loss: 1009.2479
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1253.6465 - val_loss: 992.9653
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1221.8724 - val_loss: 976.1730
Epoch 27/50
23/23 - 0s - 8ms/step - loss: 1189.5709 - val_loss: 959.0851
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 1156.7427 - val_loss: 941.5078
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 1123.8444 - val_loss: 923.7964
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 1090.9147 - val_loss: 906.0271
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 1057.2927 - val_loss: 888.1085
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 1024.5734 - val_loss: 869.8729
Epoch 33/50
23/23 - 0s - 7ms/step - loss: 991.9050 - val_loss: 851.3478
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 958.5945 - val_loss: 833.1317
Epoch 35/50
23/23 - 0s - 8ms/step - loss: 926.7418 - val_loss: 814.5223
Epoch 36/50
23/23 - 0s - 5ms/step - loss: 895.1110 - val_loss: 795.3392
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 863.7562 - val_loss: 776.4888
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 833.0984 - val_loss: 757.6116
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 803.4431 - val_loss: 737.7131
Epoch 40/50
23/23 - 0s - 3ms/step - loss: 774.3298 - val_loss: 718.8412
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 745.8748 - val_loss: 698.7046
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 718.3696 - val_loss: 678.9208
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 691.0446 - val_loss: 658.2467
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 664.0457 - val_loss: 637.6163
Epoch 45/50
23/23 - 0s - 7ms/step - loss: 638.0002 - val_loss: 616.2331
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 612.3112 - val_loss: 595.4828
Epoch 47/50
23/23 - 0s - 7ms/step - loss: 586.9379 - val_loss: 574.4468
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 562.7120 - val_loss: 552.8918
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 538.9305 - val_loss: 531.5441
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 515.3395 - val_loss: 511.3599
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 1ms/step
Mean Squared Error is:  505.72034879066956
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 29ms/step - loss: 1711.9514 - val_loss: 1231.2289
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1695.8530 - val_loss: 1218.7327
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1679.9230 - val_loss: 1206.3749
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1663.9084 - val_loss: 1193.8538
Epoch 5/50
23/23 - 0s - 5ms/step - loss: 1647.3622 - val_loss: 1181.0538
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1630.1398 - val_loss: 1167.8651
Epoch 7/50
23/23 - 0s - 5ms/step - loss: 1611.9089 - val_loss: 1154.3558
Epoch 8/50
23/23 - 0s - 5ms/step - loss: 1592.5813 - val_loss: 1139.9825
Epoch 9/50
23/23 - 0s - 7ms/step - loss: 1571.8622 - val_loss: 1125.0730
Epoch 10/50
23/23 - 0s - 5ms/step - loss: 1549.9460 - val_loss: 1109.5477
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1526.4298 - val_loss: 1093.1971
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1501.5243 - val_loss: 1076.0804
Epoch 13/50
23/23 - 0s - 7ms/step - loss: 1475.3688 - val_loss: 1058.0802
Epoch 14/50
23/23 - 0s - 5ms/step - loss: 1446.9902 - val_loss: 1039.5179
Epoch 15/50
23/23 - 0s - 6ms/step - loss: 1417.5958 - val_loss: 1019.5688
Epoch 16/50
23/23 - 0s - 8ms/step - loss: 1385.8431 - val_loss: 998.8864
Epoch 17/50
23/23 - 0s - 5ms/step - loss: 1352.8182 - val_loss: 977.4388
Epoch 18/50
23/23 - 0s - 8ms/step - loss: 1317.9081 - val_loss: 955.3094
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1281.7749 - val_loss: 932.3773
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1244.2645 - val_loss: 908.6266
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1205.7882 - val_loss: 884.1555
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1166.1168 - val_loss: 859.1467
Epoch 23/50
23/23 - 0s - 5ms/step - loss: 1125.6592 - val_loss: 834.1993
Epoch 24/50
23/23 - 0s - 5ms/step - loss: 1084.9714 - val_loss: 808.9077
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1044.0654 - val_loss: 782.8577
Epoch 26/50
23/23 - 0s - 5ms/step - loss: 1001.7509 - val_loss: 757.5013
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 960.8124 - val_loss: 731.2466
Epoch 28/50
23/23 - 0s - 5ms/step - loss: 919.3932 - val_loss: 705.5231
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 878.2269 - val_loss: 679.8814
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 838.1330 - val_loss: 654.4399
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 797.9397 - val_loss: 629.6691
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 759.5813 - val_loss: 605.1688
Epoch 33/50
23/23 - 0s - 6ms/step - loss: 721.7498 - val_loss: 581.3100
Epoch 34/50
23/23 - 0s - 6ms/step - loss: 685.4385 - val_loss: 557.8355
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 650.6595 - val_loss: 534.7747
Epoch 36/50
23/23 - 0s - 8ms/step - loss: 616.8162 - val_loss: 513.0986
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 585.4248 - val_loss: 491.8242
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 554.9225 - val_loss: 471.0961
Epoch 39/50
23/23 - 0s - 6ms/step - loss: 526.2228 - val_loss: 451.3068
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 499.4585 - val_loss: 431.6425
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 474.3401 - val_loss: 413.7415
Epoch 42/50
23/23 - 0s - 3ms/step - loss: 451.4054 - val_loss: 395.7180
Epoch 43/50
23/23 - 0s - 3ms/step - loss: 429.4269 - val_loss: 379.7227
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 410.1588 - val_loss: 363.4466
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 391.6107 - val_loss: 348.8894
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 375.0190 - val_loss: 334.8686
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 359.7559 - val_loss: 322.0455
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 346.0275 - val_loss: 309.1478
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 333.4196 - val_loss: 297.3921
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 321.6818 - val_loss: 286.6376
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  307.32051053771823
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 57ms/step - loss: 1683.2373 - val_loss: 1205.7428
Epoch 2/50
23/23 - 0s - 5ms/step - loss: 1665.4958 - val_loss: 1195.4771
Epoch 3/50
23/23 - 0s - 7ms/step - loss: 1646.3848 - val_loss: 1184.4796
Epoch 4/50
23/23 - 0s - 5ms/step - loss: 1626.1208 - val_loss: 1172.7134
Epoch 5/50
23/23 - 0s - 5ms/step - loss: 1603.8712 - val_loss: 1160.1074
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1579.9326 - val_loss: 1146.6324
Epoch 7/50
23/23 - 0s - 7ms/step - loss: 1554.0693 - val_loss: 1132.2692
Epoch 8/50
23/23 - 0s - 7ms/step - loss: 1526.8542 - val_loss: 1117.0510
Epoch 9/50
23/23 - 0s - 5ms/step - loss: 1497.2488 - val_loss: 1100.8275
Epoch 10/50
23/23 - 0s - 5ms/step - loss: 1466.0714 - val_loss: 1083.6117
Epoch 11/50
23/23 - 0s - 7ms/step - loss: 1433.5845 - val_loss: 1065.4584
Epoch 12/50
23/23 - 0s - 7ms/step - loss: 1398.6146 - val_loss: 1046.4958
Epoch 13/50
23/23 - 0s - 5ms/step - loss: 1362.2220 - val_loss: 1026.4255
Epoch 14/50
23/23 - 0s - 7ms/step - loss: 1324.3466 - val_loss: 1005.9041
Epoch 15/50
23/23 - 0s - 6ms/step - loss: 1285.3939 - val_loss: 984.6765
Epoch 16/50
23/23 - 0s - 6ms/step - loss: 1245.4360 - val_loss: 962.5909
Epoch 17/50
23/23 - 0s - 6ms/step - loss: 1204.2701 - val_loss: 940.1655
Epoch 18/50
23/23 - 0s - 6ms/step - loss: 1163.0493 - val_loss: 917.3257
Epoch 19/50
23/23 - 0s - 7ms/step - loss: 1120.9508 - val_loss: 893.8868
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1078.6276 - val_loss: 870.5364
Epoch 21/50
23/23 - 0s - 6ms/step - loss: 1036.3635 - val_loss: 847.2965
Epoch 22/50
23/23 - 0s - 7ms/step - loss: 994.4818 - val_loss: 823.0797
Epoch 23/50
23/23 - 0s - 6ms/step - loss: 952.7731 - val_loss: 799.3589
Epoch 24/50
23/23 - 0s - 7ms/step - loss: 911.9089 - val_loss: 775.8387
Epoch 25/50
23/23 - 0s - 6ms/step - loss: 871.8411 - val_loss: 751.9454
Epoch 26/50
23/23 - 0s - 7ms/step - loss: 832.6885 - val_loss: 728.9758
Epoch 27/50
23/23 - 0s - 7ms/step - loss: 794.5453 - val_loss: 705.5577
Epoch 28/50
23/23 - 0s - 8ms/step - loss: 757.9070 - val_loss: 682.2816
Epoch 29/50
23/23 - 0s - 5ms/step - loss: 722.1955 - val_loss: 660.0455
Epoch 30/50
23/23 - 0s - 5ms/step - loss: 687.9162 - val_loss: 637.8741
Epoch 31/50
23/23 - 0s - 6ms/step - loss: 655.4096 - val_loss: 616.2534
```

```
Epoch 32/50
23/23 - 0s - 7ms/step - loss: 624.2216 - val_loss: 595.2347
Epoch 33/50
23/23 - 0s - 6ms/step - loss: 594.5615 - val_loss: 574.9515
Epoch 34/50
23/23 - 0s - 6ms/step - loss: 566.5383 - val_loss: 555.1020
Epoch 35/50
23/23 - 0s - 6ms/step - loss: 540.3926 - val_loss: 535.3002
Epoch 36/50
23/23 - 0s - 7ms/step - loss: 515.3961 - val_loss: 516.8633
Epoch 37/50
23/23 - 0s - 6ms/step - loss: 492.1992 - val_loss: 498.9716
Epoch 38/50
23/23 - 0s - 6ms/step - loss: 470.7387 - val_loss: 481.2568
Epoch 39/50
23/23 - 0s - 9ms/step - loss: 450.2408 - val_loss: 464.8248
Epoch 40/50
23/23 - 0s - 7ms/step - loss: 431.3650 - val_loss: 449.1481
Epoch 41/50
23/23 - 0s - 8ms/step - loss: 414.4498 - val_loss: 432.9189
Epoch 42/50
23/23 - 0s - 6ms/step - loss: 398.0947 - val_loss: 418.6149
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 383.2927 - val_loss: 403.9442
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 369.6741 - val_loss: 390.1942
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 357.0351 - val_loss: 377.2602
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 345.4037 - val_loss: 365.5534
Epoch 47/50
23/23 - 0s - 5ms/step - loss: 335.0209 - val_loss: 354.2344
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 325.4401 - val_loss: 343.1352
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 316.3744 - val_loss: 333.1794
Epoch 50/50
23/23 - 0s - 5ms/step - loss: 308.3895 - val_loss: 323.7734
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 1ms/step
Mean Squared Error is:  310.1279855069438
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 31ms/step - loss: 1667.2684 - val_loss: 1206.4183
Epoch 2/50
23/23 - 0s - 3ms/step - loss: 1649.4014 - val_loss: 1196.5353
Epoch 3/50
23/23 - 0s - 6ms/step - loss: 1631.3973 - val_loss: 1186.5594
Epoch 4/50
23/23 - 0s - 7ms/step - loss: 1612.8168 - val_loss: 1176.0073
Epoch 5/50
23/23 - 0s - 6ms/step - loss: 1593.4695 - val_loss: 1165.2279
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1573.3395 - val_loss: 1154.0310
Epoch 7/50
23/23 - 0s - 6ms/step - loss: 1552.2690 - val_loss: 1142.6970
Epoch 8/50
23/23 - 0s - 5ms/step - loss: 1530.3156 - val_loss: 1130.5328
Epoch 9/50
23/23 - 0s - 9ms/step - loss: 1506.8688 - val_loss: 1118.2396
Epoch 10/50
23/23 - 0s - 7ms/step - loss: 1482.7141 - val_loss: 1105.0950
Epoch 11/50
23/23 - 0s - 7ms/step - loss: 1457.1464 - val_loss: 1091.6057
Epoch 12/50
23/23 - 0s - 5ms/step - loss: 1430.7301 - val_loss: 1077.4319
Epoch 13/50
23/23 - 0s - 6ms/step - loss: 1402.5934 - val_loss: 1062.6333
Epoch 14/50
23/23 - 0s - 7ms/step - loss: 1373.7526 - val_loss: 1047.0917
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1343.4152 - val_loss: 1031.0222
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1312.1285 - val_loss: 1014.0275
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1279.7708 - val_loss: 996.3146
Epoch 18/50
23/23 - 0s - 5ms/step - loss: 1246.1907 - val_loss: 978.2768
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1212.0076 - val_loss: 959.6016
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1176.8192 - val_loss: 940.5017
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1140.9001 - val_loss: 920.8156
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1104.5366 - val_loss: 900.4409
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1067.2217 - val_loss: 880.7036
Epoch 24/50
23/23 - 0s - 5ms/step - loss: 1030.6115 - val_loss: 859.5375
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 992.5016 - val_loss: 838.7821
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 955.1598 - val_loss: 817.5045
Epoch 27/50
23/23 - 0s - 5ms/step - loss: 917.0810 - val_loss: 796.3516
Epoch 28/50
23/23 - 0s - 8ms/step - loss: 879.9865 - val_loss: 774.5768
Epoch 29/50
23/23 - 0s - 5ms/step - loss: 843.2180 - val_loss: 752.2510
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 805.8320 - val_loss: 730.9445
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 770.4800 - val_loss: 708.4270
```

```
Epoch 32/50
23/23 - 0s - 5ms/step - loss: 735.2902 - val_loss: 686.2669
Epoch 33/50
23/23 - 0s - 7ms/step - loss: 700.8178 - val_loss: 664.4317
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 667.0962 - val_loss: 643.0634
Epoch 35/50
23/23 - 0s - 5ms/step - loss: 634.8227 - val_loss: 621.2042
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 603.2979 - val_loss: 599.2164
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 572.1450 - val_loss: 578.2593
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 542.5328 - val_loss: 557.7891
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 514.6758 - val_loss: 536.8586
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 487.7527 - val_loss: 515.9644
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 462.6107 - val_loss: 496.1214
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 438.0252 - val_loss: 477.8257
Epoch 43/50
23/23 - 0s - 8ms/step - loss: 415.8150 - val_loss: 459.3318
Epoch 44/50
23/23 - 0s - 3ms/step - loss: 394.9667 - val_loss: 441.6826
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 375.3508 - val_loss: 424.8556
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 357.6623 - val_loss: 408.7824
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 341.3367 - val_loss: 394.2768
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 326.5656 - val_loss: 379.9594
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 313.0445 - val_loss: 366.6620
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 300.8516 - val_loss: 354.0309
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 1ms/step
Mean Squared Error is:  312.47309755985947
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 38ms/step - loss: 1752.9056 - val_loss: 1285.0913
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1737.4407 - val_loss: 1273.4958
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1722.9781 - val_loss: 1262.3353
Epoch 4/50
23/23 - 0s - 3ms/step - loss: 1709.5250 - val_loss: 1251.5175
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1696.3658 - val_loss: 1240.9919
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1683.2214 - val_loss: 1230.3275
Epoch 7/50
23/23 - 0s - 5ms/step - loss: 1669.7546 - val_loss: 1219.2638
Epoch 8/50
23/23 - 0s - 5ms/step - loss: 1655.5288 - val_loss: 1208.1896
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1640.6530 - val_loss: 1196.9442
Epoch 10/50
23/23 - 0s - 3ms/step - loss: 1624.7188 - val_loss: 1185.5094
Epoch 11/50
23/23 - 0s - 3ms/step - loss: 1607.7512 - val_loss: 1173.7177
Epoch 12/50
23/23 - 0s - 3ms/step - loss: 1589.6688 - val_loss: 1161.7578
Epoch 13/50
23/23 - 0s - 3ms/step - loss: 1570.4480 - val_loss: 1149.3918
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1550.1489 - val_loss: 1136.7856
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1529.0713 - val_loss: 1123.9879
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1506.5801 - val_loss: 1111.0511
Epoch 17/50
23/23 - 0s - 5ms/step - loss: 1482.7030 - val_loss: 1097.9604
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1458.3279 - val_loss: 1084.2893
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1432.5426 - val_loss: 1070.5009
Epoch 20/50
23/23 - 0s - 5ms/step - loss: 1406.1312 - val_loss: 1056.4867
Epoch 21/50
23/23 - 0s - 7ms/step - loss: 1379.0007 - val_loss: 1042.0734
Epoch 22/50
23/23 - 0s - 6ms/step - loss: 1350.6765 - val_loss: 1027.3069
Epoch 23/50
23/23 - 0s - 5ms/step - loss: 1321.9448 - val_loss: 1011.9855
Epoch 24/50
23/23 - 0s - 7ms/step - loss: 1292.4734 - val_loss: 996.5474
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1262.5414 - val_loss: 980.7152
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1232.4867 - val_loss: 964.2579
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 1201.2245 - val_loss: 947.1019
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 1169.3312 - val_loss: 929.8179
Epoch 29/50
23/23 - 0s - 3ms/step - loss: 1136.3370 - val_loss: 911.5341
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 1102.7794 - val_loss: 892.7905
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 1068.7361 - val_loss: 873.4530
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 1034.6389 - val_loss: 853.6122
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 1000.2430 - val_loss: 833.7061
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 965.8096 - val_loss: 814.0622
Epoch 35/50
23/23 - 0s - 5ms/step - loss: 932.1425 - val_loss: 793.9633
Epoch 36/50
23/23 - 0s - 8ms/step - loss: 898.6533 - val_loss: 774.2235
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 865.7517 - val_loss: 754.6595
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 834.2075 - val_loss: 734.2260
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 802.4197 - val_loss: 715.0334
Epoch 40/50
23/23 - 0s - 5ms/step - loss: 772.5014 - val_loss: 695.5508
Epoch 41/50
23/23 - 0s - 8ms/step - loss: 743.1832 - val_loss: 676.5689
Epoch 42/50
23/23 - 0s - 3ms/step - loss: 714.8295 - val_loss: 657.8381
Epoch 43/50
23/23 - 0s - 3ms/step - loss: 687.7595 - val_loss: 639.4235
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 661.7963 - val_loss: 620.9601
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 636.6223 - val_loss: 603.2357
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 613.0294 - val_loss: 586.1395
Epoch 47/50
23/23 - 0s - 6ms/step - loss: 590.7338 - val_loss: 569.0909
Epoch 48/50
23/23 - 0s - 6ms/step - loss: 568.7980 - val_loss: 552.6803
Epoch 49/50
23/23 - 0s - 5ms/step - loss: 548.1644 - val_loss: 536.8203
Epoch 50/50
23/23 - 0s - 7ms/step - loss: 528.8476 - val_loss: 520.8380
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  518.9372758392814
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 27ms/step - loss: 1715.6326 - val_loss: 1229.4960
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1697.3024 - val_loss: 1217.1787
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1679.8467 - val_loss: 1205.5200
Epoch 4/50
23/23 - 0s - 8ms/step - loss: 1663.0149 - val_loss: 1194.0405
Epoch 5/50
23/23 - 0s - 5ms/step - loss: 1646.4993 - val_loss: 1182.6029
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1630.0437 - val_loss: 1171.1431
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1613.2711 - val_loss: 1159.6501
Epoch 8/50
23/23 - 0s - 3ms/step - loss: 1596.4971 - val_loss: 1148.0979
Epoch 9/50
23/23 - 0s - 5ms/step - loss: 1579.4019 - val_loss: 1136.3529
Epoch 10/50
23/23 - 0s - 5ms/step - loss: 1561.6562 - val_loss: 1124.4302
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1543.4274 - val_loss: 1112.2368
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1524.2681 - val_loss: 1099.6902
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1504.2223 - val_loss: 1086.4406
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1482.9624 - val_loss: 1073.2556
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1460.6381 - val_loss: 1058.9945
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1437.0767 - val_loss: 1044.2941
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1412.5090 - val_loss: 1028.8181
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1386.5298 - val_loss: 1013.1048
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1359.0986 - val_loss: 996.6788
Epoch 20/50
23/23 - 0s - 7ms/step - loss: 1330.9053 - val_loss: 979.7600
Epoch 21/50
23/23 - 0s - 3ms/step - loss: 1301.4321 - val_loss: 962.2478
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1270.6018 - val_loss: 944.2597
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1239.0240 - val_loss: 925.4531
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1206.1682 - val_loss: 906.2177
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1172.4359 - val_loss: 886.4006
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1138.0620 - val_loss: 866.4300
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 1103.3864 - val_loss: 846.5996
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 1068.5679 - val_loss: 825.6953
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 1033.7617 - val_loss: 804.8381
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 998.7949 - val_loss: 784.8297
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 964.7300 - val_loss: 764.3777
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 930.4680 - val_loss: 744.2206
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 897.1042 - val_loss: 724.4840
Epoch 34/50
23/23 - 0s - 3ms/step - loss: 864.8434 - val_loss: 704.1451
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 832.8167 - val_loss: 684.9356
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 802.3191 - val_loss: 665.5474
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 771.9272 - val_loss: 647.1900
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 742.6268 - val_loss: 628.5846
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 714.4349 - val_loss: 610.5637
Epoch 40/50
23/23 - 0s - 6ms/step - loss: 687.1747 - val_loss: 592.8925
Epoch 41/50
23/23 - 0s - 6ms/step - loss: 660.9882 - val_loss: 575.3000
Epoch 42/50
23/23 - 0s - 8ms/step - loss: 635.4225 - val_loss: 558.9831
Epoch 43/50
23/23 - 0s - 5ms/step - loss: 611.1718 - val_loss: 542.9833
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 588.4243 - val_loss: 526.4471
Epoch 45/50
23/23 - 0s - 3ms/step - loss: 565.9648 - val_loss: 511.2841
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 544.8271 - val_loss: 496.8432
Epoch 47/50
23/23 - 0s - 3ms/step - loss: 524.7375 - val_loss: 482.2131
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 505.6241 - val_loss: 468.2752
Epoch 49/50
23/23 - 0s - 7ms/step - loss: 487.3109 - val_loss: 454.7882
Epoch 50/50
23/23 - 0s - 5ms/step - loss: 470.0688 - val_loss: 442.4887
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 3ms/step
Mean Squared Error is:  455.53012957353815
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 45ms/step - loss: 1667.5789 - val_loss: 1212.7957
Epoch 2/50
23/23 - 0s - 5ms/step - loss: 1652.8164 - val_loss: 1201.8501
Epoch 3/50
23/23 - 0s - 6ms/step - loss: 1637.4121 - val_loss: 1190.2544
Epoch 4/50
23/23 - 0s - 5ms/step - loss: 1620.9042 - val_loss: 1178.3839
Epoch 5/50
23/23 - 0s - 5ms/step - loss: 1603.2681 - val_loss: 1165.4532
Epoch 6/50
23/23 - 0s - 8ms/step - loss: 1584.0940 - val_loss: 1151.9308
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1563.1437 - val_loss: 1137.5068
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1540.9741 - val_loss: 1122.3240
Epoch 9/50
23/23 - 0s - 5ms/step - loss: 1516.8402 - val_loss: 1105.9698
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1490.7666 - val_loss: 1089.2139
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1463.5293 - val_loss: 1071.2993
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1434.1454 - val_loss: 1052.8728
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1403.1356 - val_loss: 1033.7933
Epoch 14/50
23/23 - 0s - 3ms/step - loss: 1371.2534 - val_loss: 1012.8928
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1336.6641 - val_loss: 992.1479
Epoch 16/50
23/23 - 0s - 5ms/step - loss: 1300.4628 - val_loss: 970.9750
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1263.0188 - val_loss: 948.6542
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1223.2068 - val_loss: 926.1384
Epoch 19/50
23/23 - 0s - 3ms/step - loss: 1182.5800 - val_loss: 903.5056
Epoch 20/50
23/23 - 0s - 3ms/step - loss: 1141.2195 - val_loss: 879.9160
Epoch 21/50
23/23 - 0s - 3ms/step - loss: 1098.9224 - val_loss: 856.2817
Epoch 22/50
23/23 - 0s - 3ms/step - loss: 1056.0250 - val_loss: 832.4188
Epoch 23/50
23/23 - 0s - 3ms/step - loss: 1014.1122 - val_loss: 809.1530
Epoch 24/50
23/23 - 0s - 3ms/step - loss: 971.8845 - val_loss: 785.8544
Epoch 25/50
23/23 - 0s - 3ms/step - loss: 931.2980 - val_loss: 761.7920
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 889.9658 - val_loss: 738.3736
Epoch 27/50
23/23 - 0s - 3ms/step - loss: 850.3423 - val_loss: 715.5242
Epoch 28/50
23/23 - 0s - 3ms/step - loss: 811.3538 - val_loss: 692.8922
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 773.9208 - val_loss: 670.6556
Epoch 30/50
23/23 - 0s - 3ms/step - loss: 737.4862 - val_loss: 648.8936
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 702.5779 - val_loss: 627.5414
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 668.8494 - val_loss: 606.6929
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 636.5953 - val_loss: 586.1927
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 606.2786 - val_loss: 566.7383
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 577.5328 - val_loss: 547.4612
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 550.6017 - val_loss: 528.9741
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 524.8324 - val_loss: 510.9406
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 501.0216 - val_loss: 493.8086
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 478.5969 - val_loss: 477.3759
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 457.5929 - val_loss: 461.8606
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 438.3743 - val_loss: 446.5797
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 419.9309 - val_loss: 432.4073
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 403.0873 - val_loss: 419.0520
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 387.4847 - val_loss: 406.2232
Epoch 45/50
23/23 - 0s - 5ms/step - loss: 373.1414 - val_loss: 393.7971
Epoch 46/50
23/23 - 0s - 8ms/step - loss: 359.4255 - val_loss: 382.3753
Epoch 47/50
23/23 - 0s - 9ms/step - loss: 346.6840 - val_loss: 371.7725
Epoch 48/50
23/23 - 0s - 5ms/step - loss: 335.4117 - val_loss: 361.3743
Epoch 49/50
23/23 - 0s - 7ms/step - loss: 324.4298 - val_loss: 352.3091
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 314.7533 - val_loss: 342.6334
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  319.1124211323441
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 43ms/step - loss: 1702.3291 - val_loss: 1227.1747
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1684.9489 - val_loss: 1216.1443
Epoch 3/50
23/23 - 0s - 9ms/step - loss: 1667.8398 - val_loss: 1204.7013
Epoch 4/50
23/23 - 0s - 6ms/step - loss: 1650.3126 - val_loss: 1193.0712
Epoch 5/50
23/23 - 0s - 5ms/step - loss: 1632.5879 - val_loss: 1180.5162
Epoch 6/50
23/23 - 0s - 5ms/step - loss: 1614.0164 - val_loss: 1167.9573
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1594.7169 - val_loss: 1154.3829
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1574.3533 - val_loss: 1140.2844
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1552.8849 - val_loss: 1125.6902
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1530.4427 - val_loss: 1110.5098
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1506.9604 - val_loss: 1094.4493
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1482.2185 - val_loss: 1077.8755
Epoch 13/50
23/23 - 0s - 6ms/step - loss: 1456.3885 - val_loss: 1060.4891
Epoch 14/50
23/23 - 0s - 5ms/step - loss: 1429.6647 - val_loss: 1042.0544
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1400.7511 - val_loss: 1023.5019
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1371.2819 - val_loss: 1003.1743
Epoch 17/50
23/23 - 0s - 5ms/step - loss: 1339.9323 - val_loss: 981.7834
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1307.2374 - val_loss: 960.0359
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1273.6713 - val_loss: 937.4625
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1238.1151 - val_loss: 915.0532
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1202.6760 - val_loss: 891.5126
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1165.7874 - val_loss: 867.6973
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1128.6782 - val_loss: 843.3566
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1090.9064 - val_loss: 819.2841
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1053.0745 - val_loss: 794.9150
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1014.9779 - val_loss: 769.8999
Epoch 27/50
23/23 - 0s - 5ms/step - loss: 976.8593 - val_loss: 746.1743
Epoch 28/50
23/23 - 0s - 7ms/step - loss: 938.9889 - val_loss: 721.9913
Epoch 29/50
23/23 - 0s - 8ms/step - loss: 901.1954 - val_loss: 698.3799
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 864.3746 - val_loss: 674.3802
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 827.5854 - val_loss: 650.5821
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 792.0157 - val_loss: 628.2100
Epoch 33/50
23/23 - 0s - 3ms/step - loss: 757.5756 - val_loss: 606.2032
Epoch 34/50
23/23 - 0s - 5ms/step - loss: 723.7690 - val_loss: 585.0598
Epoch 35/50
23/23 - 0s - 7ms/step - loss: 691.5264 - val_loss: 563.4197
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 659.8688 - val_loss: 543.6495
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 630.0138 - val_loss: 524.0972
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 601.1627 - val_loss: 505.6676
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 574.1407 - val_loss: 487.6783
Epoch 40/50
23/23 - 0s - 5ms/step - loss: 548.0746 - val_loss: 470.6789
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 523.5609 - val_loss: 454.2195
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 500.4301 - val_loss: 438.5190
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 478.8391 - val_loss: 423.2580
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 457.9814 - val_loss: 410.2062
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 438.9157 - val_loss: 397.3315
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 421.5133 - val_loss: 384.5152
Epoch 47/50
23/23 - 0s - 5ms/step - loss: 404.5265 - val_loss: 373.4024
Epoch 48/50
23/23 - 0s - 5ms/step - loss: 389.0450 - val_loss: 362.5947
Epoch 49/50
23/23 - 0s - 5ms/step - loss: 374.5588 - val_loss: 352.4925
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 361.1414 - val_loss: 342.6266
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 3ms/step
Mean Squared Error is:  350.8467024101887
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 43ms/step - loss: 1705.9766 - val_loss: 1221.4021
Epoch 2/50
23/23 - 0s - 7ms/step - loss: 1688.7734 - val_loss: 1209.7727
Epoch 3/50
23/23 - 0s - 6ms/step - loss: 1671.6720 - val_loss: 1198.0267
Epoch 4/50
23/23 - 0s - 7ms/step - loss: 1654.0085 - val_loss: 1185.7380
Epoch 5/50
23/23 - 0s - 5ms/step - loss: 1635.4661 - val_loss: 1172.9071
Epoch 6/50
23/23 - 0s - 5ms/step - loss: 1615.6359 - val_loss: 1159.7722
Epoch 7/50
23/23 - 0s - 6ms/step - loss: 1594.3722 - val_loss: 1146.0537
Epoch 8/50
23/23 - 0s - 7ms/step - loss: 1571.2905 - val_loss: 1131.4076
Epoch 9/50
23/23 - 0s - 5ms/step - loss: 1546.7325 - val_loss: 1116.3380
Epoch 10/50
23/23 - 0s - 7ms/step - loss: 1520.9349 - val_loss: 1100.3190
Epoch 11/50
23/23 - 0s - 6ms/step - loss: 1493.0298 - val_loss: 1083.3204
Epoch 12/50
23/23 - 0s - 8ms/step - loss: 1463.6625 - val_loss: 1065.5193
Epoch 13/50
23/23 - 0s - 7ms/step - loss: 1432.4454 - val_loss: 1047.0775
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1399.9510 - val_loss: 1027.4354
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1365.7408 - val_loss: 1007.1712
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1329.9452 - val_loss: 986.3054
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1292.9403 - val_loss: 964.4412
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1255.2280 - val_loss: 941.7252
Epoch 19/50
23/23 - 0s - 5ms/step - loss: 1215.6128 - val_loss: 919.3969
Epoch 20/50
23/23 - 0s - 5ms/step - loss: 1176.0370 - val_loss: 895.5657
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1135.8596 - val_loss: 870.9289
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1094.9580 - val_loss: 846.7032
Epoch 23/50
23/23 - 0s - 5ms/step - loss: 1054.6367 - val_loss: 822.1682
Epoch 24/50
23/23 - 0s - 5ms/step - loss: 1013.7141 - val_loss: 797.5966
Epoch 25/50
23/23 - 0s - 5ms/step - loss: 973.6698 - val_loss: 772.5728
Epoch 26/50
23/23 - 0s - 6ms/step - loss: 933.4407 - val_loss: 747.8289
Epoch 27/50
23/23 - 0s - 3ms/step - loss: 894.2347 - val_loss: 722.7109
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 855.5454 - val_loss: 698.2655
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 817.5695 - val_loss: 674.4952
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 780.8263 - val_loss: 651.2000
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 745.3483 - val_loss: 628.1162
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 710.7999 - val_loss: 605.2063
Epoch 33/50
23/23 - 0s - 8ms/step - loss: 677.6104 - val_loss: 582.9482
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 645.6450 - val_loss: 560.8262
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 615.3589 - val_loss: 539.5148
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 586.1978 - val_loss: 518.4587
Epoch 37/50
23/23 - 0s - 6ms/step - loss: 558.5095 - val_loss: 499.0276
Epoch 38/50
23/23 - 0s - 9ms/step - loss: 532.1972 - val_loss: 479.7403
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 507.6743 - val_loss: 461.2666
Epoch 40/50
23/23 - 0s - 5ms/step - loss: 484.6155 - val_loss: 443.6125
Epoch 41/50
23/23 - 0s - 6ms/step - loss: 462.8272 - val_loss: 426.5128
Epoch 42/50
23/23 - 0s - 8ms/step - loss: 442.5213 - val_loss: 410.9017
Epoch 43/50
23/23 - 0s - 7ms/step - loss: 423.6269 - val_loss: 395.4268
Epoch 44/50
23/23 - 0s - 6ms/step - loss: 405.9973 - val_loss: 380.3518
Epoch 45/50
23/23 - 0s - 7ms/step - loss: 389.3437 - val_loss: 366.6862
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 374.2389 - val_loss: 353.4143
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 359.8990 - val_loss: 341.2769
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 347.1029 - val_loss: 329.4872
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 335.0133 - val_loss: 318.2452
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 323.8670 - val_loss: 308.4670
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  315.2362550649618
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 45ms/step - loss: 1754.8774 - val_loss: 1242.0259
Epoch 2/50
23/23 - 0s - 8ms/step - loss: 1734.1744 - val_loss: 1230.3010
Epoch 3/50
23/23 - 0s - 6ms/step - loss: 1713.6134 - val_loss: 1218.4244
Epoch 4/50
23/23 - 0s - 5ms/step - loss: 1692.9954 - val_loss: 1206.8694
Epoch 5/50
23/23 - 0s - 5ms/step - loss: 1671.8572 - val_loss: 1195.0208
Epoch 6/50
23/23 - 0s - 7ms/step - loss: 1650.4413 - val_loss: 1183.0967
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1628.0190 - val_loss: 1171.2316
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1604.6332 - val_loss: 1159.1182
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1580.9492 - val_loss: 1146.6029
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1555.5863 - val_loss: 1133.9747
Epoch 11/50
23/23 - 0s - 5ms/step - loss: 1529.7648 - val_loss: 1121.0487
Epoch 12/50
23/23 - 0s - 6ms/step - loss: 1502.4695 - val_loss: 1107.9814
Epoch 13/50
23/23 - 0s - 7ms/step - loss: 1474.3044 - val_loss: 1094.4479
Epoch 14/50
23/23 - 0s - 7ms/step - loss: 1445.4128 - val_loss: 1080.5865
Epoch 15/50
23/23 - 0s - 7ms/step - loss: 1415.2979 - val_loss: 1066.2795
Epoch 16/50
23/23 - 0s - 7ms/step - loss: 1384.1375 - val_loss: 1052.0854
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1352.5599 - val_loss: 1037.1368
Epoch 18/50
23/23 - 0s - 6ms/step - loss: 1319.4832 - val_loss: 1022.0405
Epoch 19/50
23/23 - 0s - 5ms/step - loss: 1286.3390 - val_loss: 1006.0981
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1252.1637 - val_loss: 990.3184
Epoch 21/50
23/23 - 0s - 6ms/step - loss: 1217.8883 - val_loss: 973.7316
Epoch 22/50
23/23 - 0s - 7ms/step - loss: 1183.2721 - val_loss: 956.8846
Epoch 23/50
23/23 - 0s - 8ms/step - loss: 1148.1233 - val_loss: 939.8522
Epoch 24/50
23/23 - 0s - 6ms/step - loss: 1113.4080 - val_loss: 922.1279
Epoch 25/50
23/23 - 0s - 5ms/step - loss: 1078.2069 - val_loss: 904.4863
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1043.3447 - val_loss: 886.5753
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 1009.3676 - val_loss: 868.7422
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 974.9269 - val_loss: 850.7312
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 941.9491 - val_loss: 832.7158
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 909.5790 - val_loss: 814.6786
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 877.7180 - val_loss: 796.8696
```

```
Epoch 32/50
23/23 - 0s - 8ms/step - loss: 846.8814 - val_loss: 778.7804
Epoch 33/50
23/23 - 0s - 7ms/step - loss: 816.9111 - val_loss: 760.6902
Epoch 34/50
23/23 - 0s - 7ms/step - loss: 787.8041 - val_loss: 743.1136
Epoch 35/50
23/23 - 0s - 7ms/step - loss: 759.9484 - val_loss: 725.7048
Epoch 36/50
23/23 - 0s - 6ms/step - loss: 732.3380 - val_loss: 708.4154
Epoch 37/50
23/23 - 0s - 5ms/step - loss: 706.1912 - val_loss: 691.0315
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 680.9044 - val_loss: 673.6756
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 656.2284 - val_loss: 656.7491
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 632.4514 - val_loss: 640.8377
Epoch 41/50
23/23 - 0s - 5ms/step - loss: 610.1105 - val_loss: 624.3475
Epoch 42/50
23/23 - 0s - 7ms/step - loss: 588.2113 - val_loss: 608.0220
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 566.9598 - val_loss: 592.2878
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 546.9557 - val_loss: 576.8441
Epoch 45/50
23/23 - 0s - 5ms/step - loss: 527.6450 - val_loss: 561.3439
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 508.8152 - val_loss: 546.9197
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 490.8069 - val_loss: 532.3734
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 473.7573 - val_loss: 518.2562
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 457.3911 - val_loss: 504.5743
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 441.4543 - val_loss: 491.2036
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 1ms/step
Mean Squared Error is:  450.74052731037455
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 26ms/step - loss: 1718.0387 - val_loss: 1227.1613
Epoch 2/50
23/23 - 0s - 3ms/step - loss: 1697.9480 - val_loss: 1216.3582
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1677.9225 - val_loss: 1205.4254
Epoch 4/50
23/23 - 0s - 5ms/step - loss: 1657.8885 - val_loss: 1194.3315
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1638.0099 - val_loss: 1183.1708
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1617.6984 - val_loss: 1171.8685
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1597.1519 - val_loss: 1160.2365
Epoch 8/50
23/23 - 0s - 5ms/step - loss: 1576.2340 - val_loss: 1148.3375
Epoch 9/50
23/23 - 0s - 8ms/step - loss: 1554.7455 - val_loss: 1136.2371
Epoch 10/50
23/23 - 0s - 5ms/step - loss: 1532.2588 - val_loss: 1123.9106
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1509.5319 - val_loss: 1111.1436
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1485.8025 - val_loss: 1098.0935
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1461.4121 - val_loss: 1084.4821
Epoch 14/50
23/23 - 0s - 7ms/step - loss: 1435.9318 - val_loss: 1070.6687
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1409.5430 - val_loss: 1056.4269
Epoch 16/50
23/23 - 0s - 5ms/step - loss: 1382.4894 - val_loss: 1041.9994
Epoch 17/50
23/23 - 0s - 8ms/step - loss: 1354.6708 - val_loss: 1027.0492
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1325.7872 - val_loss: 1011.8259
Epoch 19/50
23/23 - 0s - 5ms/step - loss: 1296.5004 - val_loss: 996.1532
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1266.3976 - val_loss: 980.0060
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1235.1110 - val_loss: 964.0190
Epoch 22/50
23/23 - 0s - 5ms/step - loss: 1203.7200 - val_loss: 947.3123
Epoch 23/50
23/23 - 0s - 5ms/step - loss: 1171.9369 - val_loss: 930.4598
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1139.2299 - val_loss: 913.1231
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1106.0045 - val_loss: 895.7785
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1072.5443 - val_loss: 877.8871
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 1038.9370 - val_loss: 860.2051
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 1004.7527 - val_loss: 841.7681
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 970.3967 - val_loss: 823.8728
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 936.5056 - val_loss: 805.4224
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 902.2469 - val_loss: 787.3271
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 869.1988 - val_loss: 768.4975
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 835.7824 - val_loss: 750.2480
Epoch 34/50
23/23 - 0s - 7ms/step - loss: 803.7568 - val_loss: 732.1769
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 772.0366 - val_loss: 714.0410
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 741.8371 - val_loss: 695.6676
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 712.1628 - val_loss: 678.1039
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 683.9825 - val_loss: 660.4917
Epoch 39/50
23/23 - 0s - 8ms/step - loss: 656.4822 - val_loss: 643.6641
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 630.5706 - val_loss: 626.5372
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 605.6252 - val_loss: 609.5536
Epoch 42/50
23/23 - 0s - 5ms/step - loss: 581.6274 - val_loss: 593.0712
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 558.8076 - val_loss: 576.9922
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 537.4065 - val_loss: 560.7048
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 516.9149 - val_loss: 544.5238
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 497.5219 - val_loss: 529.1714
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 479.0710 - val_loss: 513.9905
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 461.7074 - val_loss: 498.6379
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 444.8297 - val_loss: 484.2130
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 429.1494 - val_loss: 469.6342
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  435.3025007809537
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 32ms/step - loss: 1692.9882 - val_loss: 1226.7406
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1675.1840 - val_loss: 1215.7145
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1657.6860 - val_loss: 1204.7114
Epoch 4/50
23/23 - 0s - 7ms/step - loss: 1639.6489 - val_loss: 1193.6400
Epoch 5/50
23/23 - 0s - 6ms/step - loss: 1620.8192 - val_loss: 1182.3207
Epoch 6/50
23/23 - 0s - 6ms/step - loss: 1600.5317 - val_loss: 1170.5717
Epoch 7/50
23/23 - 0s - 5ms/step - loss: 1579.0857 - val_loss: 1157.6942
Epoch 8/50
23/23 - 0s - 7ms/step - loss: 1555.9089 - val_loss: 1144.2609
Epoch 9/50
23/23 - 0s - 6ms/step - loss: 1531.4298 - val_loss: 1130.1060
Epoch 10/50
23/23 - 0s - 6ms/step - loss: 1505.5529 - val_loss: 1114.4810
Epoch 11/50
23/23 - 0s - 5ms/step - loss: 1477.6757 - val_loss: 1098.6078
Epoch 12/50
23/23 - 0s - 5ms/step - loss: 1448.7268 - val_loss: 1081.8552
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1418.1299 - val_loss: 1064.6558
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1386.5696 - val_loss: 1046.6001
Epoch 15/50
23/23 - 0s - 5ms/step - loss: 1353.9869 - val_loss: 1027.5585
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1319.8098 - val_loss: 1007.9706
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1285.0669 - val_loss: 988.0768
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1249.5055 - val_loss: 967.2306
Epoch 19/50
23/23 - 0s - 5ms/step - loss: 1213.1659 - val_loss: 945.8295
Epoch 20/50
23/23 - 0s - 8ms/step - loss: 1175.7194 - val_loss: 924.4131
Epoch 21/50
23/23 - 0s - 7ms/step - loss: 1138.4675 - val_loss: 902.2586
Epoch 22/50
23/23 - 0s - 6ms/step - loss: 1100.3425 - val_loss: 879.9977
Epoch 23/50
23/23 - 0s - 7ms/step - loss: 1062.0157 - val_loss: 856.8416
Epoch 24/50
23/23 - 0s - 6ms/step - loss: 1023.6522 - val_loss: 833.4558
Epoch 25/50
23/23 - 0s - 5ms/step - loss: 985.6611 - val_loss: 810.1700
Epoch 26/50
23/23 - 0s - 5ms/step - loss: 946.8296 - val_loss: 787.1207
Epoch 27/50
23/23 - 0s - 7ms/step - loss: 908.8497 - val_loss: 763.3180
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 870.4341 - val_loss: 740.1219
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 832.6738 - val_loss: 715.9396
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 794.7859 - val_loss: 692.5200
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 757.4387 - val_loss: 668.7415
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 720.6901 - val_loss: 645.6472
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 684.5712 - val_loss: 622.4555
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 650.1213 - val_loss: 599.5836
Epoch 35/50
23/23 - 0s - 8ms/step - loss: 616.0944 - val_loss: 577.5843
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 584.1957 - val_loss: 555.7501
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 553.2328 - val_loss: 535.2805
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 523.8170 - val_loss: 515.4537
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 496.6671 - val_loss: 496.3089
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 471.1716 - val_loss: 478.4294
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 447.2616 - val_loss: 461.6205
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 425.4035 - val_loss: 445.1139
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 404.6511 - val_loss: 430.4923
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 386.2242 - val_loss: 416.2588
Epoch 45/50
23/23 - 0s - 5ms/step - loss: 369.3258 - val_loss: 403.0243
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 353.5911 - val_loss: 390.7165
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 339.7289 - val_loss: 378.6479
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 326.8409 - val_loss: 368.6279
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 315.7716 - val_loss: 358.3781
Epoch 50/50
23/23 - 0s - 5ms/step - loss: 305.1830 - val_loss: 349.9702
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  315.15422541152253
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 30ms/step - loss: 1669.7590 - val_loss: 1165.1068
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1649.1793 - val_loss: 1151.1747
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1628.6608 - val_loss: 1136.8752
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1607.5643 - val_loss: 1122.1202
Epoch 5/50
23/23 - 0s - 5ms/step - loss: 1586.0438 - val_loss: 1106.6841
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1564.0004 - val_loss: 1090.4877
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1541.0829 - val_loss: 1074.4110
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1517.6271 - val_loss: 1056.7433
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1493.1716 - val_loss: 1039.1357
Epoch 10/50
23/23 - 0s - 5ms/step - loss: 1467.9567 - val_loss: 1020.7409
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1441.6182 - val_loss: 1001.8348
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1414.6819 - val_loss: 982.1084
Epoch 13/50
23/23 - 0s - 5ms/step - loss: 1386.5519 - val_loss: 962.4551
Epoch 14/50
23/23 - 0s - 5ms/step - loss: 1357.5265 - val_loss: 942.6857
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1327.7313 - val_loss: 922.1000
Epoch 16/50
23/23 - 0s - 10ms/step - loss: 1296.8790 - val_loss: 901.0237
Epoch 17/50
23/23 - 0s - 5ms/step - loss: 1264.9178 - val_loss: 879.6752
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1231.6949 - val_loss: 858.4977
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1198.4069 - val_loss: 836.6833
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1163.4722 - val_loss: 815.6542
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1128.0280 - val_loss: 793.1470
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1090.9675 - val_loss: 771.5173
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1052.9956 - val_loss: 749.2728
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1015.2663 - val_loss: 727.1210
Epoch 25/50
23/23 - 0s - 8ms/step - loss: 975.5311 - val_loss: 704.6384
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 935.8443 - val_loss: 682.4539
Epoch 27/50
23/23 - 0s - 5ms/step - loss: 895.6339 - val_loss: 660.1966
Epoch 28/50
23/23 - 0s - 3ms/step - loss: 854.8903 - val_loss: 637.7206
Epoch 29/50
23/23 - 0s - 3ms/step - loss: 813.6608 - val_loss: 616.2280
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 773.7200 - val_loss: 594.8159
Epoch 31/50
23/23 - 0s - 7ms/step - loss: 733.3812 - val_loss: 573.5467
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 694.7599 - val_loss: 552.5508
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 656.1519 - val_loss: 532.3740
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 619.4582 - val_loss: 512.6654
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 583.6652 - val_loss: 494.1322
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 549.8138 - val_loss: 475.9599
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 517.9194 - val_loss: 458.7680
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 486.9497 - val_loss: 442.2927
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 458.1804 - val_loss: 426.5250
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 430.9962 - val_loss: 411.9646
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 406.8195 - val_loss: 397.1180
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 383.7113 - val_loss: 384.2976
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 362.9802 - val_loss: 371.8410
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 344.0265 - val_loss: 360.5484
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 326.8227 - val_loss: 349.4673
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 311.4998 - val_loss: 339.0474
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 297.5543 - val_loss: 329.6048
Epoch 48/50
23/23 - 0s - 7ms/step - loss: 285.1487 - val_loss: 321.0198
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 274.4050 - val_loss: 312.3649
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 264.3533 - val_loss: 304.3280
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  272.8567898169785
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 32ms/step - loss: 1656.2917 - val_loss: 1185.8420
Epoch 2/50
23/23 - 0s - 3ms/step - loss: 1639.0312 - val_loss: 1174.0724
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1621.1626 - val_loss: 1161.9945
Epoch 4/50
23/23 - 0s - 3ms/step - loss: 1602.7958 - val_loss: 1149.4374
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1583.0887 - val_loss: 1136.0585
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1562.4591 - val_loss: 1121.7103
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1540.0859 - val_loss: 1106.6259
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1516.3611 - val_loss: 1090.2172
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1490.7266 - val_loss: 1072.7975
Epoch 10/50
23/23 - 0s - 7ms/step - loss: 1463.7537 - val_loss: 1054.4446
Epoch 11/50
23/23 - 0s - 3ms/step - loss: 1434.4089 - val_loss: 1035.0198
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1403.8802 - val_loss: 1013.7646
Epoch 13/50
23/23 - 0s - 5ms/step - loss: 1370.6990 - val_loss: 992.3250
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1336.4865 - val_loss: 969.6838
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1300.6581 - val_loss: 945.9083
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1263.0706 - val_loss: 921.8215
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1224.4642 - val_loss: 897.1920
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1184.5875 - val_loss: 871.4295
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1143.3821 - val_loss: 845.1927
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1101.9135 - val_loss: 818.6707
Epoch 21/50
23/23 - 0s - 5ms/step - loss: 1059.5471 - val_loss: 792.3369
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1016.9730 - val_loss: 765.7033
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 973.8488 - val_loss: 739.8051
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 931.2673 - val_loss: 712.5380
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 888.8956 - val_loss: 685.6531
Epoch 26/50
23/23 - 0s - 8ms/step - loss: 845.9669 - val_loss: 660.0685
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 804.9715 - val_loss: 634.2394
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 764.6465 - val_loss: 609.1721
Epoch 29/50
23/23 - 0s - 3ms/step - loss: 725.1572 - val_loss: 584.8622
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 687.4223 - val_loss: 560.4329
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 650.7302 - val_loss: 537.0172
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 615.4625 - val_loss: 514.6182
Epoch 33/50
23/23 - 0s - 7ms/step - loss: 581.6209 - val_loss: 492.7720
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 549.2059 - val_loss: 472.3127
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 518.8209 - val_loss: 452.3226
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 489.4014 - val_loss: 433.2784
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 462.3027 - val_loss: 414.6084
Epoch 38/50
23/23 - 0s - 5ms/step - loss: 436.6873 - val_loss: 397.2204
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 412.7486 - val_loss: 381.0123
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 390.7688 - val_loss: 365.5797
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 370.3500 - val_loss: 351.4342
Epoch 42/50
23/23 - 0s - 6ms/step - loss: 351.8911 - val_loss: 337.7496
Epoch 43/50
23/23 - 0s - 5ms/step - loss: 334.9323 - val_loss: 324.6242
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 319.6201 - val_loss: 312.8668
Epoch 45/50
23/23 - 0s - 7ms/step - loss: 305.6422 - val_loss: 302.0363
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 292.9576 - val_loss: 292.1555
Epoch 47/50
23/23 - 0s - 5ms/step - loss: 281.7903 - val_loss: 282.7394
Epoch 48/50
23/23 - 0s - 5ms/step - loss: 271.7239 - val_loss: 274.2752
Epoch 49/50
23/23 - 0s - 5ms/step - loss: 262.6919 - val_loss: 266.3604
Epoch 50/50
23/23 - 0s - 8ms/step - loss: 254.9642 - val_loss: 259.4164
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  253.50540255691527
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 25ms/step - loss: 1609.9126 - val_loss: 1161.8943
Epoch 2/50
23/23 - 0s - 3ms/step - loss: 1592.1680 - val_loss: 1149.9222
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1573.5149 - val_loss: 1137.2704
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1553.4510 - val_loss: 1123.8558
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1531.8181 - val_loss: 1109.9812
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1508.6370 - val_loss: 1095.1412
Epoch 7/50
23/23 - 0s - 3ms/step - loss: 1484.2128 - val_loss: 1079.4042
Epoch 8/50
23/23 - 0s - 5ms/step - loss: 1457.7363 - val_loss: 1063.2833
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1430.3141 - val_loss: 1046.5388
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1401.3215 - val_loss: 1028.4872
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1370.9360 - val_loss: 1010.1866
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1338.9092 - val_loss: 991.5902
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1306.1523 - val_loss: 971.8610
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1271.3289 - val_loss: 951.7696
Epoch 15/50
23/23 - 0s - 5ms/step - loss: 1235.7759 - val_loss: 931.1343
Epoch 16/50
23/23 - 0s - 8ms/step - loss: 1199.1166 - val_loss: 910.0447
Epoch 17/50
23/23 - 0s - 6ms/step - loss: 1161.9541 - val_loss: 888.9200
Epoch 18/50
23/23 - 0s - 8ms/step - loss: 1124.2372 - val_loss: 867.0460
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1085.3402 - val_loss: 845.6625
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1045.8984 - val_loss: 823.8348
Epoch 21/50
23/23 - 0s - 3ms/step - loss: 1006.6407 - val_loss: 801.9152
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 967.0901 - val_loss: 780.2441
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 927.6300 - val_loss: 758.2562
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 888.6669 - val_loss: 736.2357
Epoch 25/50
23/23 - 0s - 3ms/step - loss: 849.6793 - val_loss: 714.4301
Epoch 26/50
23/23 - 0s - 5ms/step - loss: 812.5021 - val_loss: 692.2854
Epoch 27/50
23/23 - 0s - 6ms/step - loss: 775.0782 - val_loss: 671.6218
Epoch 28/50
23/23 - 0s - 5ms/step - loss: 739.1577 - val_loss: 650.2369
Epoch 29/50
23/23 - 0s - 5ms/step - loss: 704.1367 - val_loss: 629.3118
Epoch 30/50
23/23 - 0s - 7ms/step - loss: 670.0096 - val_loss: 609.0233
Epoch 31/50
23/23 - 0s - 7ms/step - loss: 637.2202 - val_loss: 589.1010
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 605.7328 - val_loss: 569.8085
Epoch 33/50
23/23 - 0s - 3ms/step - loss: 575.7820 - val_loss: 550.4048
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 547.2213 - val_loss: 531.7195
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 519.9030 - val_loss: 513.6172
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 494.1943 - val_loss: 496.5767
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 470.1598 - val_loss: 480.2014
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 447.9793 - val_loss: 464.2535
Epoch 39/50
23/23 - 0s - 3ms/step - loss: 426.8492 - val_loss: 448.4092
Epoch 40/50
23/23 - 0s - 6ms/step - loss: 407.3287 - val_loss: 433.2668
Epoch 41/50
23/23 - 0s - 7ms/step - loss: 389.1849 - val_loss: 419.2799
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 372.4409 - val_loss: 405.1475
Epoch 43/50
23/23 - 0s - 7ms/step - loss: 356.7855 - val_loss: 392.4875
Epoch 44/50
23/23 - 0s - 3ms/step - loss: 342.7011 - val_loss: 379.9749
Epoch 45/50
23/23 - 0s - 5ms/step - loss: 329.6663 - val_loss: 368.1856
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 317.4849 - val_loss: 357.3945
Epoch 47/50
23/23 - 0s - 3ms/step - loss: 306.9389 - val_loss: 346.8026
Epoch 48/50
23/23 - 0s - 5ms/step - loss: 296.7413 - val_loss: 336.9097
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 287.5926 - val_loss: 327.7035
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 279.3014 - val_loss: 318.6414
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  288.1337831596924
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 46ms/step - loss: 1675.5020 - val_loss: 1211.9445
Epoch 2/50
23/23 - 0s - 5ms/step - loss: 1659.8934 - val_loss: 1201.7875
Epoch 3/50
23/23 - 0s - 6ms/step - loss: 1644.5286 - val_loss: 1191.3885
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1628.8264 - val_loss: 1180.6478
Epoch 5/50
23/23 - 0s - 8ms/step - loss: 1612.7006 - val_loss: 1169.5609
Epoch 6/50
23/23 - 0s - 5ms/step - loss: 1595.6321 - val_loss: 1157.9061
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1578.0127 - val_loss: 1145.8882
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1559.1158 - val_loss: 1133.1028
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1539.1968 - val_loss: 1119.5258
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1518.2426 - val_loss: 1105.1051
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1495.8407 - val_loss: 1089.6193
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1472.1946 - val_loss: 1073.5129
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1447.0134 - val_loss: 1057.0044
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1420.6295 - val_loss: 1039.1896
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1392.6370 - val_loss: 1021.0331
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1363.4854 - val_loss: 1001.5594
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1332.7732 - val_loss: 981.7590
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1300.9528 - val_loss: 961.0562
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1268.0104 - val_loss: 940.0388
Epoch 20/50
23/23 - 0s - 8ms/step - loss: 1234.1440 - val_loss: 918.4399
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1199.6544 - val_loss: 895.8736
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1164.2415 - val_loss: 873.1725
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1128.2328 - val_loss: 850.7272
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1092.1394 - val_loss: 827.5945
Epoch 25/50
23/23 - 0s - 6ms/step - loss: 1054.7578 - val_loss: 804.1968
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1017.0008 - val_loss: 780.1900
Epoch 27/50
23/23 - 0s - 5ms/step - loss: 978.6071 - val_loss: 756.6399
Epoch 28/50
23/23 - 0s - 7ms/step - loss: 940.1108 - val_loss: 732.3138
Epoch 29/50
23/23 - 0s - 6ms/step - loss: 901.4315 - val_loss: 707.8775
Epoch 30/50
23/23 - 0s - 5ms/step - loss: 862.7947 - val_loss: 684.5331
Epoch 31/50
23/23 - 0s - 5ms/step - loss: 824.2094 - val_loss: 660.7891
```

```
Epoch 32/50
23/23 - 0s - 7ms/step - loss: 786.8527 - val_loss: 637.3358
Epoch 33/50
23/23 - 0s - 5ms/step - loss: 749.5891 - val_loss: 614.8760
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 713.5410 - val_loss: 592.4630
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 678.4229 - val_loss: 570.7841
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 644.7184 - val_loss: 550.3651
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 612.2938 - val_loss: 529.6577
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 581.5076 - val_loss: 510.3302
Epoch 39/50
23/23 - 0s - 5ms/step - loss: 551.4236 - val_loss: 491.4076
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 522.9711 - val_loss: 474.1585
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 496.6489 - val_loss: 456.5091
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 470.8977 - val_loss: 440.2306
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 447.4769 - val_loss: 424.7471
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 425.3594 - val_loss: 409.9653
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 404.6529 - val_loss: 395.9588
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 385.5681 - val_loss: 382.6642
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 367.3181 - val_loss: 371.0013
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 351.0542 - val_loss: 358.5715
Epoch 49/50
23/23 - 0s - 5ms/step - loss: 335.6757 - val_loss: 347.5663
Epoch 50/50
23/23 - 0s - 6ms/step - loss: 321.7529 - val_loss: 337.2350
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  321.44610323128643

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
Epoch 1/50
23/23 - 1s - 47ms/step - loss: 1707.8915 - val_loss: 1236.1731
Epoch 2/50
23/23 - 0s - 9ms/step - loss: 1689.6093 - val_loss: 1222.0028
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1671.7710 - val_loss: 1207.8264
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1653.7181 - val_loss: 1193.7515
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1635.0880 - val_loss: 1179.6331
Epoch 6/50
23/23 - 0s - 5ms/step - loss: 1615.8021 - val_loss: 1165.1075
Epoch 7/50
23/23 - 0s - 7ms/step - loss: 1595.5760 - val_loss: 1150.4766
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1574.1718 - val_loss: 1135.1661
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1551.3234 - val_loss: 1119.4290
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1526.8258 - val_loss: 1102.9498
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1500.7233 - val_loss: 1085.8065
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1472.3800 - val_loss: 1067.5603
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1442.0209 - val_loss: 1048.9125
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1410.7355 - val_loss: 1029.0513
Epoch 15/50
23/23 - 0s - 3ms/step - loss: 1376.9534 - val_loss: 1008.7134
Epoch 16/50
23/23 - 0s - 5ms/step - loss: 1341.9655 - val_loss: 986.8589
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1305.1862 - val_loss: 964.5805
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1266.7336 - val_loss: 942.4450
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1228.1990 - val_loss: 919.4854
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1187.7313 - val_loss: 895.4011
Epoch 21/50
23/23 - 0s - 3ms/step - loss: 1146.4056 - val_loss: 871.4041
Epoch 22/50
23/23 - 0s - 5ms/step - loss: 1105.3475 - val_loss: 846.5402
Epoch 23/50
23/23 - 0s - 6ms/step - loss: 1063.0474 - val_loss: 822.2177
Epoch 24/50
23/23 - 0s - 6ms/step - loss: 1021.4771 - val_loss: 797.7282
Epoch 25/50
23/23 - 0s - 5ms/step - loss: 980.0804 - val_loss: 772.9894
Epoch 26/50
23/23 - 0s - 5ms/step - loss: 938.9832 - val_loss: 748.0325
Epoch 27/50
23/23 - 0s - 3ms/step - loss: 898.5775 - val_loss: 723.9284
Epoch 28/50
23/23 - 0s - 5ms/step - loss: 859.6234 - val_loss: 699.5010
Epoch 29/50
23/23 - 0s - 7ms/step - loss: 820.6508 - val_loss: 676.0516
Epoch 30/50
23/23 - 0s - 3ms/step - loss: 783.2121 - val_loss: 652.6835
Epoch 31/50
```

```
23/23 - 0s - 4ms/step - loss: 747.6173 - val_loss: 630.0531
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 712.9012 - val_loss: 608.0040
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 679.7729 - val_loss: 586.2654
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 648.3055 - val_loss: 565.0237
Epoch 35/50
23/23 - 0s - 6ms/step - loss: 617.7086 - val_loss: 545.4123
Epoch 36/50
23/23 - 0s - 6ms/step - loss: 589.1453 - val_loss: 525.6721
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 561.8513 - val_loss: 506.5553
Epoch 38/50
23/23 - 0s - 8ms/step - loss: 535.8788 - val_loss: 488.8361
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 511.6794 - val_loss: 470.9500
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 488.5573 - val_loss: 454.7869
Epoch 41/50
23/23 - 0s - 5ms/step - loss: 467.2960 - val_loss: 438.9039
Epoch 42/50
23/23 - 0s - 5ms/step - loss: 447.1018 - val_loss: 424.0378
Epoch 43/50
23/23 - 0s - 5ms/step - loss: 428.5640 - val_loss: 409.5980
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 410.9190 - val_loss: 396.7296
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 394.6271 - val_loss: 383.9168
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 379.4346 - val_loss: 371.7101
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 365.3840 - val_loss: 360.6484
Epoch 48/50
23/23 - 0s - 5ms/step - loss: 352.3257 - val_loss: 350.1859
Epoch 49/50
23/23 - 0s - 5ms/step - loss: 340.4280 - val_loss: 340.4868
Epoch 50/50
23/23 - 0s - 5ms/step - loss: 329.2965 - val_loss: 331.4544
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  326.108746138473
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 40ms/step - loss: 1743.6682 - val_loss: 1244.4690
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1727.1538 - val_loss: 1233.6129
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1711.1228 - val_loss: 1223.1262
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1695.3424 - val_loss: 1212.7025
Epoch 5/50
23/23 - 0s - 6ms/step - loss: 1679.4860 - val_loss: 1202.2611
Epoch 6/50
23/23 - 0s - 5ms/step - loss: 1663.4789 - val_loss: 1191.6919
Epoch 7/50
23/23 - 0s - 7ms/step - loss: 1646.9316 - val_loss: 1180.8107
Epoch 8/50
23/23 - 0s - 5ms/step - loss: 1630.0890 - val_loss: 1169.5062
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1612.4246 - val_loss: 1157.9453
Epoch 10/50
23/23 - 0s - 3ms/step - loss: 1593.9819 - val_loss: 1145.9844
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1574.4762 - val_loss: 1133.3246
Epoch 12/50
23/23 - 0s - 6ms/step - loss: 1553.9100 - val_loss: 1119.8639
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1532.0223 - val_loss: 1105.7479
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1508.9131 - val_loss: 1090.9695
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1484.6874 - val_loss: 1075.1860
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1459.1266 - val_loss: 1059.0840
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1433.0308 - val_loss: 1041.6727
Epoch 18/50
23/23 - 0s - 7ms/step - loss: 1405.3418 - val_loss: 1023.6219
Epoch 19/50
23/23 - 0s - 5ms/step - loss: 1377.1083 - val_loss: 1005.0676
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1347.7711 - val_loss: 986.0930
Epoch 21/50
23/23 - 0s - 8ms/step - loss: 1317.5663 - val_loss: 965.8852
Epoch 22/50
23/23 - 0s - 9ms/step - loss: 1285.9877 - val_loss: 945.6953
Epoch 23/50
23/23 - 0s - 6ms/step - loss: 1253.6718 - val_loss: 923.9202
Epoch 24/50
23/23 - 0s - 5ms/step - loss: 1219.9207 - val_loss: 901.8386
Epoch 25/50
23/23 - 0s - 7ms/step - loss: 1184.9885 - val_loss: 878.7763
Epoch 26/50
23/23 - 0s - 5ms/step - loss: 1148.5757 - val_loss: 855.5985
Epoch 27/50
23/23 - 0s - 7ms/step - loss: 1111.2764 - val_loss: 831.3542
Epoch 28/50
23/23 - 0s - 7ms/step - loss: 1072.9200 - val_loss: 807.0082
Epoch 29/50
23/23 - 0s - 7ms/step - loss: 1034.1106 - val_loss: 782.5488
Epoch 30/50
23/23 - 0s - 5ms/step - loss: 994.9266 - val_loss: 757.6858
Epoch 31/50
23/23 - 0s - 6ms/step - loss: 955.3461 - val_loss: 733.4312
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 916.8870 - val_loss: 708.7161
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 878.4803 - val_loss: 684.0682
Epoch 34/50
23/23 - 0s - 5ms/step - loss: 840.5940 - val_loss: 660.4268
Epoch 35/50
23/23 - 0s - 8ms/step - loss: 804.3380 - val_loss: 637.0873
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 768.3661 - val_loss: 614.5750
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 733.6297 - val_loss: 592.1918
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 699.9738 - val_loss: 570.5252
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 667.3347 - val_loss: 549.6683
Epoch 40/50
23/23 - 0s - 5ms/step - loss: 636.2453 - val_loss: 528.7396
Epoch 41/50
23/23 - 0s - 7ms/step - loss: 606.2977 - val_loss: 509.2809
Epoch 42/50
23/23 - 0s - 8ms/step - loss: 577.9633 - val_loss: 489.9151
Epoch 43/50
23/23 - 0s - 7ms/step - loss: 550.5306 - val_loss: 471.5458
Epoch 44/50
23/23 - 0s - 7ms/step - loss: 525.2699 - val_loss: 453.8226
Epoch 45/50
23/23 - 0s - 7ms/step - loss: 500.7657 - val_loss: 437.1420
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 478.1025 - val_loss: 420.9536
Epoch 47/50
23/23 - 0s - 9ms/step - loss: 456.7615 - val_loss: 405.3933
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 436.4720 - val_loss: 391.2000
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 418.3060 - val_loss: 377.0392
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 400.6457 - val_loss: 363.2635
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  382.97521237143604
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 44ms/step - loss: 1720.0946 - val_loss: 1260.7971
Epoch 2/50
23/23 - 0s - 5ms/step - loss: 1699.8967 - val_loss: 1243.6276
Epoch 3/50
23/23 - 0s - 5ms/step - loss: 1680.2738 - val_loss: 1227.1748
Epoch 4/50
23/23 - 0s - 8ms/step - loss: 1661.9069 - val_loss: 1210.6931
Epoch 5/50
23/23 - 0s - 6ms/step - loss: 1643.9640 - val_loss: 1194.8665
Epoch 6/50
23/23 - 0s - 7ms/step - loss: 1626.5946 - val_loss: 1179.3745
Epoch 7/50
23/23 - 0s - 5ms/step - loss: 1609.4823 - val_loss: 1164.2527
Epoch 8/50
23/23 - 0s - 7ms/step - loss: 1592.5343 - val_loss: 1149.2921
Epoch 9/50
23/23 - 0s - 7ms/step - loss: 1575.4773 - val_loss: 1134.3136
Epoch 10/50
23/23 - 0s - 5ms/step - loss: 1558.4622 - val_loss: 1119.3202
Epoch 11/50
23/23 - 0s - 5ms/step - loss: 1541.2710 - val_loss: 1104.1807
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1523.5416 - val_loss: 1089.2134
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1505.7174 - val_loss: 1074.1277
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1487.4628 - val_loss: 1059.1254
Epoch 15/50
23/23 - 0s - 5ms/step - loss: 1469.0024 - val_loss: 1043.3977
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1449.7061 - val_loss: 1028.5421
Epoch 17/50
23/23 - 0s - 5ms/step - loss: 1430.4648 - val_loss: 1013.1333
Epoch 18/50
23/23 - 0s - 5ms/step - loss: 1410.6475 - val_loss: 997.0704
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1390.1852 - val_loss: 981.7938
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1369.7568 - val_loss: 965.8331
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1348.6683 - val_loss: 949.8173
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1327.1843 - val_loss: 933.8450
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1305.5417 - val_loss: 917.6610
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1283.5328 - val_loss: 901.4358
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1261.5132 - val_loss: 885.0029
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1239.0465 - val_loss: 868.7291
Epoch 27/50
23/23 - 0s - 6ms/step - loss: 1216.7798 - val_loss: 851.9500
Epoch 28/50
23/23 - 0s - 6ms/step - loss: 1194.0463 - val_loss: 835.6638
Epoch 29/50
23/23 - 0s - 5ms/step - loss: 1171.6470 - val_loss: 819.3624
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 1148.8542 - val_loss: 803.3663
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 1126.2299 - val_loss: 787.2155
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 1103.5857 - val_loss: 770.9854
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 1080.2297 - val_loss: 755.2186
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 1056.5856 - val_loss: 739.3146
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 1032.7100 - val_loss: 723.3701
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 1009.0330 - val_loss: 707.3069
Epoch 37/50
23/23 - 0s - 5ms/step - loss: 984.7682 - val_loss: 691.7108
Epoch 38/50
23/23 - 0s - 7ms/step - loss: 959.9374 - val_loss: 675.7703
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 934.8315 - val_loss: 659.7073
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 908.8932 - val_loss: 644.2765
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 882.8698 - val_loss: 628.2136
Epoch 42/50
23/23 - 0s - 5ms/step - loss: 856.2795 - val_loss: 612.3181
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 829.0400 - val_loss: 596.3115
Epoch 44/50
23/23 - 0s - 5ms/step - loss: 801.3903 - val_loss: 580.5801
Epoch 45/50
23/23 - 0s - 5ms/step - loss: 772.7958 - val_loss: 565.0533
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 744.4313 - val_loss: 549.9913
Epoch 47/50
23/23 - 0s - 6ms/step - loss: 716.3969 - val_loss: 534.7706
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 687.8051 - val_loss: 520.3464
Epoch 49/50
23/23 - 0s - 5ms/step - loss: 660.4467 - val_loss: 505.7650
Epoch 50/50
23/23 - 0s - 7ms/step - loss: 633.2577 - val_loss: 491.9003
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  580.623434632996
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 28ms/step - loss: 1671.5437 - val_loss: 1200.2108
Epoch 2/50
23/23 - 0s - 3ms/step - loss: 1654.6230 - val_loss: 1186.6898
Epoch 3/50
23/23 - 0s - 3ms/step - loss: 1636.9822 - val_loss: 1172.6161
Epoch 4/50
23/23 - 0s - 3ms/step - loss: 1618.2876 - val_loss: 1157.9388
Epoch 5/50
23/23 - 0s - 3ms/step - loss: 1598.2850 - val_loss: 1142.9425
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1577.0729 - val_loss: 1127.1644
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1554.6580 - val_loss: 1110.4064
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1530.8291 - val_loss: 1093.0657
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1505.1952 - val_loss: 1074.5374
Epoch 10/50
23/23 - 0s - 3ms/step - loss: 1478.2896 - val_loss: 1054.9243
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1449.7084 - val_loss: 1034.9531
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1419.7921 - val_loss: 1013.4403
Epoch 13/50
23/23 - 0s - 6ms/step - loss: 1388.6748 - val_loss: 991.9193
Epoch 14/50
23/23 - 0s - 5ms/step - loss: 1356.2286 - val_loss: 969.3998
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1322.8507 - val_loss: 946.9163
Epoch 16/50
23/23 - 0s - 5ms/step - loss: 1288.4462 - val_loss: 923.1898
Epoch 17/50
23/23 - 0s - 7ms/step - loss: 1253.3092 - val_loss: 899.1546
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1217.2535 - val_loss: 875.1953
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1180.8964 - val_loss: 850.8385
Epoch 20/50
23/23 - 0s - 5ms/step - loss: 1143.8259 - val_loss: 826.8890
Epoch 21/50
23/23 - 0s - 5ms/step - loss: 1107.0677 - val_loss: 802.3680
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1069.5270 - val_loss: 777.9636
Epoch 23/50
23/23 - 0s - 5ms/step - loss: 1032.3103 - val_loss: 754.2917
Epoch 24/50
23/23 - 0s - 7ms/step - loss: 995.3645 - val_loss: 730.5453
Epoch 25/50
23/23 - 0s - 6ms/step - loss: 958.0080 - val_loss: 707.0417
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 921.6797 - val_loss: 684.1600
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 885.4645 - val_loss: 661.0891
Epoch 28/50
23/23 - 0s - 5ms/step - loss: 849.7106 - val_loss: 639.5455
Epoch 29/50
23/23 - 0s - 5ms/step - loss: 814.1479 - val_loss: 617.3792
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 779.7628 - val_loss: 596.0525
Epoch 31/50
23/23 - 0s - 8ms/step - loss: 745.9849 - val_loss: 575.6429
```

```
Epoch 32/50
23/23 - 0s - 5ms/step - loss: 712.5906 - val_loss: 556.2693
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 680.9310 - val_loss: 536.8911
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 649.2825 - val_loss: 519.2649
Epoch 35/50
23/23 - 0s - 5ms/step - loss: 619.3452 - val_loss: 501.3261
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 590.1002 - val_loss: 484.4298
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 562.2450 - val_loss: 467.8251
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 535.3019 - val_loss: 452.6515
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 509.9025 - val_loss: 438.3594
Epoch 40/50
23/23 - 0s - 5ms/step - loss: 485.8095 - val_loss: 424.7931
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 462.6982 - val_loss: 411.5985
Epoch 42/50
23/23 - 0s - 8ms/step - loss: 440.9898 - val_loss: 399.8034
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 420.5394 - val_loss: 388.1572
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 401.7082 - val_loss: 377.1740
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 384.1468 - val_loss: 367.1804
Epoch 46/50
23/23 - 0s - 5ms/step - loss: 367.8288 - val_loss: 358.3885
Epoch 47/50
23/23 - 0s - 5ms/step - loss: 353.1494 - val_loss: 349.8174
Epoch 48/50
23/23 - 0s - 10ms/step - loss: 339.1248 - val_loss: 341.6905
Epoch 49/50
23/23 - 0s - 6ms/step - loss: 326.7646 - val_loss: 334.0674
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 314.9707 - val_loss: 326.4948
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  314.07016998178693
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 33ms/step - loss: 1742.7911 - val_loss: 1259.5327
Epoch 2/50
23/23 - 0s - 3ms/step - loss: 1723.6465 - val_loss: 1249.1476
Epoch 3/50
23/23 - 0s - 3ms/step - loss: 1705.0721 - val_loss: 1239.1890
Epoch 4/50
23/23 - 0s - 3ms/step - loss: 1687.5581 - val_loss: 1229.5262
Epoch 5/50
23/23 - 0s - 3ms/step - loss: 1669.9188 - val_loss: 1220.3590
Epoch 6/50
23/23 - 0s - 3ms/step - loss: 1652.8379 - val_loss: 1211.1432
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1635.7821 - val_loss: 1202.0903
Epoch 8/50
23/23 - 0s - 6ms/step - loss: 1618.5729 - val_loss: 1192.8788
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1601.0892 - val_loss: 1183.4323
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1583.1089 - val_loss: 1173.8735
Epoch 11/50
23/23 - 0s - 10ms/step - loss: 1564.6919 - val_loss: 1163.8702
Epoch 12/50
23/23 - 0s - 5ms/step - loss: 1545.2025 - val_loss: 1153.4054
Epoch 13/50
23/23 - 0s - 8ms/step - loss: 1525.2578 - val_loss: 1142.3212
Epoch 14/50
23/23 - 0s - 6ms/step - loss: 1503.6470 - val_loss: 1130.6677
Epoch 15/50
23/23 - 0s - 5ms/step - loss: 1480.8745 - val_loss: 1118.4655
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1456.7657 - val_loss: 1105.3467
Epoch 17/50
23/23 - 0s - 7ms/step - loss: 1430.8628 - val_loss: 1091.4598
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1404.4603 - val_loss: 1076.7031
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1375.9019 - val_loss: 1060.9667
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1346.5405 - val_loss: 1044.8175
Epoch 21/50
23/23 - 0s - 5ms/step - loss: 1316.4467 - val_loss: 1027.5085
Epoch 22/50
23/23 - 0s - 7ms/step - loss: 1284.5297 - val_loss: 1009.6313
Epoch 23/50
23/23 - 0s - 6ms/step - loss: 1251.7664 - val_loss: 990.4421
Epoch 24/50
23/23 - 0s - 6ms/step - loss: 1218.4326 - val_loss: 970.7252
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1183.8976 - val_loss: 950.6330
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1148.9460 - val_loss: 929.6664
Epoch 27/50
23/23 - 0s - 6ms/step - loss: 1113.4100 - val_loss: 907.9813
Epoch 28/50
23/23 - 0s - 5ms/step - loss: 1077.2130 - val_loss: 886.3737
Epoch 29/50
23/23 - 0s - 7ms/step - loss: 1041.0009 - val_loss: 864.0540
Epoch 30/50
23/23 - 0s - 5ms/step - loss: 1005.0931 - val_loss: 841.1394
Epoch 31/50
23/23 - 0s - 5ms/step - loss: 968.7690 - val_loss: 818.4117
```

```
Epoch 32/50
23/23 - 0s - 5ms/step - loss: 932.8030 - val_loss: 795.9338
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 898.1630 - val_loss: 772.5161
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 863.0432 - val_loss: 750.0314
Epoch 35/50
23/23 - 0s - 8ms/step - loss: 828.9738 - val_loss: 727.2592
Epoch 36/50
23/23 - 0s - 5ms/step - loss: 795.6915 - val_loss: 705.0037
Epoch 37/50
23/23 - 0s - 8ms/step - loss: 763.3208 - val_loss: 682.7778
Epoch 38/50
23/23 - 0s - 6ms/step - loss: 731.6696 - val_loss: 661.4706
Epoch 39/50
23/23 - 0s - 5ms/step - loss: 700.9960 - val_loss: 639.9741
Epoch 40/50
23/23 - 0s - 6ms/step - loss: 671.6450 - val_loss: 619.2596
Epoch 41/50
23/23 - 0s - 5ms/step - loss: 642.6969 - val_loss: 599.2812
Epoch 42/50
23/23 - 0s - 5ms/step - loss: 615.3452 - val_loss: 579.4277
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 588.8927 - val_loss: 560.0742
Epoch 44/50
23/23 - 0s - 7ms/step - loss: 563.6401 - val_loss: 542.1854
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 539.7263 - val_loss: 524.2628
Epoch 46/50
23/23 - 0s - 5ms/step - loss: 517.1674 - val_loss: 506.7121
Epoch 47/50
23/23 - 0s - 5ms/step - loss: 495.6671 - val_loss: 490.3179
Epoch 48/50
23/23 - 0s - 5ms/step - loss: 475.3321 - val_loss: 474.4053
Epoch 49/50
23/23 - 0s - 7ms/step - loss: 455.9160 - val_loss: 459.9560
Epoch 50/50
23/23 - 0s - 5ms/step - loss: 438.2694 - val_loss: 445.0789
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  433.61198900053546
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 49ms/step - loss: 1695.4102 - val_loss: 1218.7952
Epoch 2/50
23/23 - 0s - 6ms/step - loss: 1680.6263 - val_loss: 1206.5563
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1665.7228 - val_loss: 1194.0323
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1650.5773 - val_loss: 1181.1871
Epoch 5/50
23/23 - 0s - 6ms/step - loss: 1634.6548 - val_loss: 1168.2551
Epoch 6/50
23/23 - 0s - 5ms/step - loss: 1618.1448 - val_loss: 1154.6569
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1600.7413 - val_loss: 1140.8206
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1582.6687 - val_loss: 1126.3282
Epoch 9/50
23/23 - 0s - 5ms/step - loss: 1563.1595 - val_loss: 1111.3315
Epoch 10/50
23/23 - 0s - 7ms/step - loss: 1542.6610 - val_loss: 1095.9420
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1521.1040 - val_loss: 1079.7606
Epoch 12/50
23/23 - 0s - 6ms/step - loss: 1498.3073 - val_loss: 1063.3220
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1474.5820 - val_loss: 1045.6785
Epoch 14/50
23/23 - 0s - 5ms/step - loss: 1449.7732 - val_loss: 1027.8752
Epoch 15/50
23/23 - 0s - 5ms/step - loss: 1423.0807 - val_loss: 1009.8430
Epoch 16/50
23/23 - 0s - 5ms/step - loss: 1395.6293 - val_loss: 990.8655
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1366.4968 - val_loss: 971.4338
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1336.4451 - val_loss: 951.0824
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1304.6542 - val_loss: 930.3402
Epoch 20/50
23/23 - 0s - 5ms/step - loss: 1271.9740 - val_loss: 909.2557
Epoch 21/50
23/23 - 0s - 7ms/step - loss: 1237.9531 - val_loss: 887.0782
Epoch 22/50
23/23 - 0s - 8ms/step - loss: 1202.5024 - val_loss: 864.7562
Epoch 23/50
23/23 - 0s - 5ms/step - loss: 1165.9990 - val_loss: 841.8825
Epoch 24/50
23/23 - 0s - 6ms/step - loss: 1128.9995 - val_loss: 818.5262
Epoch 25/50
23/23 - 0s - 8ms/step - loss: 1090.3076 - val_loss: 794.2352
Epoch 26/50
23/23 - 0s - 6ms/step - loss: 1050.8278 - val_loss: 770.1460
Epoch 27/50
23/23 - 0s - 5ms/step - loss: 1010.7183 - val_loss: 746.0081
Epoch 28/50
23/23 - 0s - 7ms/step - loss: 970.0120 - val_loss: 721.2851
Epoch 29/50
23/23 - 0s - 7ms/step - loss: 929.3245 - val_loss: 696.9211
Epoch 30/50
23/23 - 0s - 5ms/step - loss: 888.7976 - val_loss: 672.2217
Epoch 31/50
23/23 - 0s - 6ms/step - loss: 848.6842 - val_loss: 647.1067
```

```
Epoch 32/50
23/23 - 0s - 6ms/step - loss: 808.7826 - val_loss: 622.6198
Epoch 33/50
23/23 - 0s - 5ms/step - loss: 769.5668 - val_loss: 598.7161
Epoch 34/50
23/23 - 0s - 5ms/step - loss: 731.7918 - val_loss: 574.8896
Epoch 35/50
23/23 - 0s - 5ms/step - loss: 694.8292 - val_loss: 551.8906
Epoch 36/50
23/23 - 0s - 6ms/step - loss: 659.3531 - val_loss: 529.5020
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 625.5109 - val_loss: 507.7899
Epoch 38/50
23/23 - 0s - 9ms/step - loss: 593.5558 - val_loss: 486.1850
Epoch 39/50
23/23 - 0s - 5ms/step - loss: 562.4922 - val_loss: 466.2571
Epoch 40/50
23/23 - 0s - 8ms/step - loss: 533.7730 - val_loss: 446.5698
Epoch 41/50
23/23 - 0s - 5ms/step - loss: 506.2829 - val_loss: 427.5349
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 480.9541 - val_loss: 409.6819
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 456.8187 - val_loss: 393.3599
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 434.7156 - val_loss: 376.7582
Epoch 45/50
23/23 - 0s - 5ms/step - loss: 413.9207 - val_loss: 361.3648
Epoch 46/50
23/23 - 0s - 5ms/step - loss: 394.4247 - val_loss: 347.0617
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 376.5240 - val_loss: 333.4019
Epoch 48/50
23/23 - 0s - 7ms/step - loss: 360.1024 - val_loss: 320.1330
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 345.1099 - val_loss: 308.2851
Epoch 50/50
23/23 - 0s - 8ms/step - loss: 331.3025 - val_loss: 296.9611
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 3ms/step
Mean Squared Error is:  316.00449494974407
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 41ms/step - loss: 1753.7422 - val_loss: 1280.9740
Epoch 2/50
23/23 - 0s - 3ms/step - loss: 1735.2480 - val_loss: 1268.6031
Epoch 3/50
23/23 - 0s - 3ms/step - loss: 1717.1337 - val_loss: 1256.7904
Epoch 4/50
23/23 - 0s - 5ms/step - loss: 1699.7334 - val_loss: 1245.0886
Epoch 5/50
23/23 - 0s - 3ms/step - loss: 1682.4282 - val_loss: 1233.5876
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1665.0544 - val_loss: 1222.1051
Epoch 7/50
23/23 - 0s - 8ms/step - loss: 1647.1422 - val_loss: 1210.5520
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1628.7186 - val_loss: 1199.0840
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1609.7537 - val_loss: 1187.3948
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1590.1910 - val_loss: 1175.9355
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1570.0033 - val_loss: 1164.1598
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1548.8978 - val_loss: 1152.2075
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1526.8210 - val_loss: 1140.4519
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1503.7594 - val_loss: 1128.3834
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1480.2555 - val_loss: 1116.2821
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1455.6146 - val_loss: 1103.8503
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1430.4102 - val_loss: 1091.4392
Epoch 18/50
23/23 - 0s - 6ms/step - loss: 1404.5171 - val_loss: 1079.0634
Epoch 19/50
23/23 - 0s - 8ms/step - loss: 1377.8716 - val_loss: 1065.9009
Epoch 20/50
23/23 - 0s - 6ms/step - loss: 1350.9000 - val_loss: 1052.8450
Epoch 21/50
23/23 - 0s - 7ms/step - loss: 1323.1084 - val_loss: 1040.0209
Epoch 22/50
23/23 - 0s - 5ms/step - loss: 1295.3826 - val_loss: 1027.1735
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1267.2920 - val_loss: 1013.5375
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1238.8793 - val_loss: 1000.0494
Epoch 25/50
23/23 - 0s - 5ms/step - loss: 1210.3516 - val_loss: 986.3987
Epoch 26/50
23/23 - 0s - 7ms/step - loss: 1181.1787 - val_loss: 972.7252
Epoch 27/50
23/23 - 0s - 8ms/step - loss: 1152.5690 - val_loss: 959.1042
Epoch 28/50
23/23 - 0s - 3ms/step - loss: 1124.2841 - val_loss: 945.0217
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 1095.3141 - val_loss: 931.3291
Epoch 30/50
23/23 - 0s - 5ms/step - loss: 1067.0573 - val_loss: 917.0134
Epoch 31/50
23/23 - 0s - 7ms/step - loss: 1038.8223 - val_loss: 902.5721
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 1010.8958 - val_loss: 887.9892
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 983.0126 - val_loss: 873.4772
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 956.0139 - val_loss: 858.7548
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 929.3399 - val_loss: 844.1534
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 903.3711 - val_loss: 829.5789
Epoch 37/50
23/23 - 0s - 5ms/step - loss: 878.0772 - val_loss: 814.4146
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 853.3027 - val_loss: 799.9315
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 830.0203 - val_loss: 784.5176
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 806.7300 - val_loss: 770.0815
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 784.4335 - val_loss: 755.0177
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 762.8030 - val_loss: 740.0594
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 742.6176 - val_loss: 725.7124
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 722.6064 - val_loss: 710.5638
Epoch 45/50
23/23 - 0s - 3ms/step - loss: 703.3564 - val_loss: 695.5624
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 684.4924 - val_loss: 680.2837
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 666.0726 - val_loss: 665.4673
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 648.4732 - val_loss: 650.3853
Epoch 49/50
23/23 - 0s - 8ms/step - loss: 631.2736 - val_loss: 635.5059
Epoch 50/50
23/23 - 0s - 7ms/step - loss: 614.3356 - val_loss: 620.0823
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 3ms/step
Mean Squared Error is:  609.8464679508563
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 51ms/step - loss: 1706.3536 - val_loss: 1232.6353
Epoch 2/50
23/23 - 0s - 10ms/step - loss: 1696.0684 - val_loss: 1223.0015
Epoch 3/50
23/23 - 0s - 6ms/step - loss: 1685.4565 - val_loss: 1213.4225
Epoch 4/50
23/23 - 0s - 8ms/step - loss: 1674.0643 - val_loss: 1203.4973
Epoch 5/50
23/23 - 0s - 7ms/step - loss: 1661.3903 - val_loss: 1193.0422
Epoch 6/50
23/23 - 0s - 7ms/step - loss: 1647.0504 - val_loss: 1181.9928
Epoch 7/50
23/23 - 0s - 5ms/step - loss: 1630.8490 - val_loss: 1170.1346
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1612.3370 - val_loss: 1157.4237
Epoch 9/50
23/23 - 0s - 5ms/step - loss: 1591.8141 - val_loss: 1143.5835
Epoch 10/50
23/23 - 0s - 5ms/step - loss: 1569.0044 - val_loss: 1128.6111
Epoch 11/50
23/23 - 0s - 7ms/step - loss: 1543.5293 - val_loss: 1112.7756
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1516.2042 - val_loss: 1095.3660
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1486.1493 - val_loss: 1077.2410
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1453.7748 - val_loss: 1057.5021
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1419.3119 - val_loss: 1036.7104
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1381.5533 - val_loss: 1015.2298
Epoch 17/50
23/23 - 0s - 10ms/step - loss: 1342.6750 - val_loss: 992.7219
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1301.3636 - val_loss: 969.6157
Epoch 19/50
23/23 - 0s - 6ms/step - loss: 1259.4324 - val_loss: 946.1684
Epoch 20/50
23/23 - 0s - 7ms/step - loss: 1216.2994 - val_loss: 922.2392
Epoch 21/50
23/23 - 0s - 12ms/step - loss: 1172.6125 - val_loss: 897.7343
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1127.4440 - val_loss: 873.4401
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1083.6676 - val_loss: 848.5076
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1039.0212 - val_loss: 823.9960
Epoch 25/50
23/23 - 0s - 5ms/step - loss: 995.0013 - val_loss: 799.6394
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 951.9367 - val_loss: 774.8455
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 909.2154 - val_loss: 750.6868
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 867.3436 - val_loss: 726.8149
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 826.8587 - val_loss: 703.2493
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 787.2188 - val_loss: 679.8768
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 749.6902 - val_loss: 657.3023
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 712.6304 - val_loss: 634.9819
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 677.3594 - val_loss: 612.7324
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 643.9663 - val_loss: 592.0007
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 612.1617 - val_loss: 571.4161
Epoch 36/50
23/23 - 0s - 5ms/step - loss: 581.7336 - val_loss: 551.3812
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 553.2664 - val_loss: 532.0622
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 526.2077 - val_loss: 512.3861
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 500.7521 - val_loss: 494.3847
Epoch 40/50
23/23 - 0s - 5ms/step - loss: 477.2836 - val_loss: 476.5294
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 455.0960 - val_loss: 459.7729
Epoch 42/50
23/23 - 0s - 6ms/step - loss: 434.5685 - val_loss: 443.7667
Epoch 43/50
23/23 - 0s - 6ms/step - loss: 415.7974 - val_loss: 428.2505
Epoch 44/50
23/23 - 0s - 6ms/step - loss: 398.2201 - val_loss: 413.0056
Epoch 45/50
23/23 - 0s - 6ms/step - loss: 381.8356 - val_loss: 399.1659
Epoch 46/50
23/23 - 0s - 3ms/step - loss: 366.8778 - val_loss: 385.2835
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 353.0937 - val_loss: 372.1313
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 340.2140 - val_loss: 359.9851
Epoch 49/50
23/23 - 0s - 3ms/step - loss: 328.6825 - val_loss: 348.0510
Epoch 50/50
23/23 - 0s - 3ms/step - loss: 317.9201 - val_loss: 336.6797
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 3ms/step
Mean Squared Error is:  319.576158283909
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 47ms/step - loss: 1686.3824 - val_loss: 1211.2609
Epoch 2/50
23/23 - 0s - 6ms/step - loss: 1669.6233 - val_loss: 1198.3477
Epoch 3/50
23/23 - 0s - 5ms/step - loss: 1653.3339 - val_loss: 1185.5931
Epoch 4/50
23/23 - 0s - 6ms/step - loss: 1636.6837 - val_loss: 1172.8375
Epoch 5/50
23/23 - 0s - 5ms/step - loss: 1620.0543 - val_loss: 1159.7352
Epoch 6/50
23/23 - 0s - 6ms/step - loss: 1602.5426 - val_loss: 1146.7227
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1584.7517 - val_loss: 1133.3151
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1565.9083 - val_loss: 1119.2778
Epoch 9/50
23/23 - 0s - 3ms/step - loss: 1545.9104 - val_loss: 1105.5098
Epoch 10/50
23/23 - 0s - 3ms/step - loss: 1525.1271 - val_loss: 1090.7729
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1502.7759 - val_loss: 1076.1252
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1479.1342 - val_loss: 1060.5140
Epoch 13/50
23/23 - 0s - 5ms/step - loss: 1454.0044 - val_loss: 1044.5856
Epoch 14/50
23/23 - 0s - 5ms/step - loss: 1427.4760 - val_loss: 1028.2867
Epoch 15/50
23/23 - 0s - 6ms/step - loss: 1399.7982 - val_loss: 1010.9726
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1370.9014 - val_loss: 993.4167
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1340.5164 - val_loss: 975.2640
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1309.2710 - val_loss: 955.9788
Epoch 19/50
23/23 - 0s - 5ms/step - loss: 1276.2302 - val_loss: 936.6442
Epoch 20/50
23/23 - 0s - 5ms/step - loss: 1241.6086 - val_loss: 915.9920
Epoch 21/50
23/23 - 0s - 8ms/step - loss: 1205.6499 - val_loss: 894.3117
Epoch 22/50
23/23 - 0s - 6ms/step - loss: 1167.7026 - val_loss: 870.9532
Epoch 23/50
23/23 - 0s - 7ms/step - loss: 1128.2645 - val_loss: 847.8300
Epoch 24/50
23/23 - 0s - 5ms/step - loss: 1087.7334 - val_loss: 822.7401
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1045.6322 - val_loss: 797.6015
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1003.4286 - val_loss: 771.0789
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 960.1210 - val_loss: 744.0746
Epoch 28/50
23/23 - 0s - 7ms/step - loss: 915.7562 - val_loss: 717.9011
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 872.3907 - val_loss: 690.7902
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 829.6089 - val_loss: 663.8295
Epoch 31/50
23/23 - 0s - 5ms/step - loss: 787.6223 - val_loss: 636.6844
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 745.7271 - val_loss: 610.7625
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 705.9106 - val_loss: 584.9083
Epoch 34/50
23/23 - 0s - 5ms/step - loss: 667.9561 - val_loss: 559.4609
Epoch 35/50
23/23 - 0s - 5ms/step - loss: 630.5748 - val_loss: 535.8477
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 595.1714 - val_loss: 513.2336
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 562.3470 - val_loss: 490.0413
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 530.8347 - val_loss: 468.2158
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 500.9055 - val_loss: 447.6194
Epoch 40/50
23/23 - 0s - 3ms/step - loss: 473.4285 - val_loss: 428.2716
Epoch 41/50
23/23 - 0s - 3ms/step - loss: 447.6053 - val_loss: 409.5835
Epoch 42/50
23/23 - 0s - 3ms/step - loss: 423.4866 - val_loss: 392.0135
Epoch 43/50
23/23 - 0s - 3ms/step - loss: 401.6249 - val_loss: 374.7928
Epoch 44/50
23/23 - 0s - 3ms/step - loss: 381.6882 - val_loss: 358.7241
Epoch 45/50
23/23 - 0s - 3ms/step - loss: 362.7571 - val_loss: 344.1199
Epoch 46/50
23/23 - 0s - 3ms/step - loss: 346.2013 - val_loss: 330.1555
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 330.7893 - val_loss: 317.3647
Epoch 48/50
23/23 - 0s - 7ms/step - loss: 316.9241 - val_loss: 305.3633
Epoch 49/50
23/23 - 0s - 6ms/step - loss: 304.4250 - val_loss: 293.9716
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 293.0704 - val_loss: 283.7614
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  286.443230406993
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 52ms/step - loss: 1788.2250 - val_loss: 1255.6316
Epoch 2/50
23/23 - 0s - 6ms/step - loss: 1765.9617 - val_loss: 1241.5618
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1744.8258 - val_loss: 1228.2937
Epoch 4/50
23/23 - 0s - 5ms/step - loss: 1724.5597 - val_loss: 1215.2167
Epoch 5/50
23/23 - 0s - 7ms/step - loss: 1704.9930 - val_loss: 1202.4445
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1685.9135 - val_loss: 1189.9463
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1667.2050 - val_loss: 1177.2310
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1648.5447 - val_loss: 1164.5994
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1630.4764 - val_loss: 1151.8909
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1612.1823 - val_loss: 1139.0514
Epoch 11/50
23/23 - 0s - 9ms/step - loss: 1593.8065 - val_loss: 1125.9349
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1575.2268 - val_loss: 1112.9835
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1556.2365 - val_loss: 1099.6404
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1536.9457 - val_loss: 1085.6117
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1516.7875 - val_loss: 1071.5575
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1496.2339 - val_loss: 1055.9608
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1474.3871 - val_loss: 1039.8635
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1451.7391 - val_loss: 1023.4623
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1428.9174 - val_loss: 1006.1410
Epoch 20/50
23/23 - 0s - 5ms/step - loss: 1404.8923 - val_loss: 988.2474
Epoch 21/50
23/23 - 0s - 6ms/step - loss: 1380.4823 - val_loss: 968.9983
Epoch 22/50
23/23 - 0s - 5ms/step - loss: 1354.6400 - val_loss: 950.5839
Epoch 23/50
23/23 - 0s - 5ms/step - loss: 1328.8456 - val_loss: 931.4601
Epoch 24/50
23/23 - 0s - 6ms/step - loss: 1302.3019 - val_loss: 911.6907
Epoch 25/50
23/23 - 0s - 6ms/step - loss: 1275.2399 - val_loss: 891.2755
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1247.2753 - val_loss: 871.2708
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 1219.4393 - val_loss: 850.5191
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 1190.6278 - val_loss: 830.6161
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 1162.7501 - val_loss: 810.0007
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 1133.8337 - val_loss: 789.3232
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 1105.3879 - val_loss: 768.4827
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 1076.4402 - val_loss: 748.6407
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 1048.5497 - val_loss: 728.2006
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 1020.5708 - val_loss: 707.8577
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 993.2584 - val_loss: 688.0838
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 965.2617 - val_loss: 669.4560
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 939.0306 - val_loss: 649.9927
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 912.6472 - val_loss: 631.4496
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 886.6552 - val_loss: 613.2231
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 861.3967 - val_loss: 595.6479
Epoch 41/50
23/23 - 0s - 5ms/step - loss: 836.9736 - val_loss: 578.3043
Epoch 42/50
23/23 - 0s - 5ms/step - loss: 813.0590 - val_loss: 561.6674
Epoch 43/50
23/23 - 0s - 6ms/step - loss: 789.7487 - val_loss: 545.0706
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 767.3610 - val_loss: 529.5895
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 745.6545 - val_loss: 514.7332
Epoch 46/50
23/23 - 0s - 5ms/step - loss: 724.7278 - val_loss: 500.0294
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 704.3531 - val_loss: 485.9245
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 685.0597 - val_loss: 472.2779
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 666.0591 - val_loss: 459.7553
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 648.3962 - val_loss: 446.8129
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  581.4450798926807
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 45ms/step - loss: 1695.1028 - val_loss: 1216.3375
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1677.1984 - val_loss: 1203.6624
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1658.7859 - val_loss: 1190.7734
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1640.1230 - val_loss: 1177.1088
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1620.8292 - val_loss: 1163.1979
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1600.9456 - val_loss: 1148.7505
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1579.7987 - val_loss: 1134.0309
Epoch 8/50
23/23 - 0s - 3ms/step - loss: 1557.7773 - val_loss: 1118.4211
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1534.3528 - val_loss: 1101.9055
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1509.6033 - val_loss: 1085.1404
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1483.2401 - val_loss: 1067.9006
Epoch 12/50
23/23 - 0s - 8ms/step - loss: 1456.1567 - val_loss: 1049.8768
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1427.4801 - val_loss: 1031.2750
Epoch 14/50
23/23 - 0s - 5ms/step - loss: 1397.6709 - val_loss: 1012.1838
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1366.2650 - val_loss: 992.7027
Epoch 16/50
23/23 - 0s - 5ms/step - loss: 1334.2002 - val_loss: 972.6636
Epoch 17/50
23/23 - 0s - 8ms/step - loss: 1301.0420 - val_loss: 952.0898
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1266.8955 - val_loss: 931.2991
Epoch 19/50
23/23 - 0s - 5ms/step - loss: 1232.2406 - val_loss: 909.9756
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1196.8403 - val_loss: 888.5245
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1161.0989 - val_loss: 866.6396
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1125.2524 - val_loss: 844.6696
Epoch 23/50
23/23 - 0s - 8ms/step - loss: 1088.7936 - val_loss: 822.8071
Epoch 24/50
23/23 - 0s - 8ms/step - loss: 1052.6257 - val_loss: 800.4796
Epoch 25/50
23/23 - 0s - 7ms/step - loss: 1016.4302 - val_loss: 778.3492
Epoch 26/50
23/23 - 0s - 5ms/step - loss: 980.0980 - val_loss: 756.3721
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 944.3299 - val_loss: 734.9704
Epoch 28/50
23/23 - 0s - 8ms/step - loss: 908.8840 - val_loss: 712.9842
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 873.9627 - val_loss: 691.4456
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 839.7250 - val_loss: 670.2731
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 806.0530 - val_loss: 649.4898
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 773.5058 - val_loss: 629.3327
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 741.4835 - val_loss: 609.3842
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 710.8169 - val_loss: 589.9374
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 680.9138 - val_loss: 570.5347
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 652.1026 - val_loss: 552.2982
Epoch 37/50
23/23 - 0s - 6ms/step - loss: 624.1061 - val_loss: 533.9482
Epoch 38/50
23/23 - 0s - 6ms/step - loss: 597.4071 - val_loss: 516.8421
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 572.1226 - val_loss: 499.6041
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 547.4522 - val_loss: 483.1181
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 524.3571 - val_loss: 467.8457
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 501.9770 - val_loss: 452.7959
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 481.0792 - val_loss: 437.8919
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 461.1921 - val_loss: 424.1067
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 442.4218 - val_loss: 410.8138
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 424.6578 - val_loss: 397.9341
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 407.7541 - val_loss: 385.4851
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 392.1198 - val_loss: 373.7275
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 377.3838 - val_loss: 362.7268
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 363.4292 - val_loss: 352.3169
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  355.3803059617851
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 47ms/step - loss: 1599.4158 - val_loss: 1132.8306
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1575.5525 - val_loss: 1118.4561
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1551.0404 - val_loss: 1103.1288
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1524.8907 - val_loss: 1087.3920
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1498.1555 - val_loss: 1070.7352
Epoch 6/50
23/23 - 0s - 9ms/step - loss: 1469.4939 - val_loss: 1053.4974
Epoch 7/50
23/23 - 0s - 6ms/step - loss: 1439.8416 - val_loss: 1035.2845
Epoch 8/50
23/23 - 0s - 5ms/step - loss: 1408.6179 - val_loss: 1016.0974
Epoch 9/50
23/23 - 0s - 6ms/step - loss: 1375.8119 - val_loss: 996.6719
Epoch 10/50
23/23 - 0s - 7ms/step - loss: 1342.5507 - val_loss: 976.5593
Epoch 11/50
23/23 - 0s - 7ms/step - loss: 1308.2332 - val_loss: 955.4731
Epoch 12/50
23/23 - 0s - 6ms/step - loss: 1272.9529 - val_loss: 933.9333
Epoch 13/50
23/23 - 0s - 6ms/step - loss: 1236.1396 - val_loss: 912.3136
Epoch 14/50
23/23 - 0s - 9ms/step - loss: 1199.2571 - val_loss: 890.0505
Epoch 15/50
23/23 - 0s - 6ms/step - loss: 1161.4945 - val_loss: 867.4507
Epoch 16/50
23/23 - 0s - 7ms/step - loss: 1123.4945 - val_loss: 844.6459
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1085.0806 - val_loss: 821.7701
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1046.7228 - val_loss: 798.7799
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1007.9585 - val_loss: 775.6606
Epoch 20/50
23/23 - 0s - 6ms/step - loss: 969.2781 - val_loss: 752.3793
Epoch 21/50
23/23 - 0s - 7ms/step - loss: 931.1456 - val_loss: 728.8566
Epoch 22/50
23/23 - 0s - 6ms/step - loss: 893.2572 - val_loss: 706.5588
Epoch 23/50
23/23 - 0s - 5ms/step - loss: 856.2785 - val_loss: 683.2422
Epoch 24/50
23/23 - 0s - 5ms/step - loss: 819.8051 - val_loss: 661.0195
Epoch 25/50
23/23 - 0s - 5ms/step - loss: 784.2690 - val_loss: 638.4185
Epoch 26/50
23/23 - 0s - 7ms/step - loss: 749.9528 - val_loss: 615.9083
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 716.0820 - val_loss: 594.6473
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 684.0112 - val_loss: 573.0027
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 652.6709 - val_loss: 552.2946
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 623.0027 - val_loss: 532.4872
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 594.0790 - val_loss: 513.4080
```

```
Epoch 32/50
23/23 - 0s - 5ms/step - loss: 567.0491 - val_loss: 494.2298
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 541.0845 - val_loss: 475.8987
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 516.6210 - val_loss: 458.6198
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 493.2385 - val_loss: 441.2730
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 471.6927 - val_loss: 424.3410
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 450.5054 - val_loss: 408.6348
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 431.2122 - val_loss: 393.8569
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 412.8931 - val_loss: 379.6534
Epoch 40/50
23/23 - 0s - 5ms/step - loss: 395.9091 - val_loss: 366.0363
Epoch 41/50
23/23 - 0s - 6ms/step - loss: 380.0756 - val_loss: 353.0714
Epoch 42/50
23/23 - 0s - 6ms/step - loss: 364.8652 - val_loss: 341.6114
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 351.4673 - val_loss: 330.5392
Epoch 44/50
23/23 - 0s - 8ms/step - loss: 338.5677 - val_loss: 319.5579
Epoch 45/50
23/23 - 0s - 7ms/step - loss: 326.7718 - val_loss: 309.9260
Epoch 46/50
23/23 - 0s - 6ms/step - loss: 315.4019 - val_loss: 301.0535
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 305.1646 - val_loss: 293.3209
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 295.4824 - val_loss: 285.8122
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 286.5983 - val_loss: 278.7560
Epoch 50/50
23/23 - 0s - 7ms/step - loss: 278.1379 - val_loss: 271.9966
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  273.2585601135532
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 59ms/step - loss: 1620.1501 - val_loss: 1171.5305
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1599.9628 - val_loss: 1158.8005
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1579.2072 - val_loss: 1145.6639
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1558.1183 - val_loss: 1131.6522
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1535.8052 - val_loss: 1116.9624
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1512.9906 - val_loss: 1101.4209
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1488.9431 - val_loss: 1085.1542
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1463.9603 - val_loss: 1067.9073
Epoch 9/50
23/23 - 0s - 6ms/step - loss: 1437.9198 - val_loss: 1049.4465
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1410.1093 - val_loss: 1030.7152
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1381.0690 - val_loss: 1011.3017
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1350.9185 - val_loss: 990.6301
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1318.7468 - val_loss: 969.2124
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1285.4357 - val_loss: 947.0122
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1250.0422 - val_loss: 924.4019
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1213.2734 - val_loss: 900.4662
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1174.8578 - val_loss: 876.1636
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1135.5811 - val_loss: 851.1604
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1095.4075 - val_loss: 825.8522
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1054.6594 - val_loss: 801.0850
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1013.1281 - val_loss: 775.7529
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 971.4255 - val_loss: 750.5043
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 929.4891 - val_loss: 725.4319
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 887.6165 - val_loss: 700.8553
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 846.0295 - val_loss: 676.3995
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 804.8965 - val_loss: 652.0043
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 764.2501 - val_loss: 629.2018
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 725.4985 - val_loss: 606.1656
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 686.1472 - val_loss: 584.4507
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 649.0183 - val_loss: 562.6356
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 613.3204 - val_loss: 541.9312
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 579.0191 - val_loss: 522.4779
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 546.3765 - val_loss: 503.7160
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 515.4288 - val_loss: 485.7622
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 486.2570 - val_loss: 468.6107
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 459.3499 - val_loss: 452.2426
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 433.6277 - val_loss: 436.8756
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 410.4304 - val_loss: 421.5735
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 388.2407 - val_loss: 408.0222
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 368.3354 - val_loss: 395.1361
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 350.5773 - val_loss: 382.9094
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 333.9046 - val_loss: 370.9852
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 319.1415 - val_loss: 360.7100
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 306.1461 - val_loss: 350.5210
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 294.4672 - val_loss: 341.1007
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 284.0934 - val_loss: 332.5969
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 274.7833 - val_loss: 324.5005
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 266.5180 - val_loss: 316.9699
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 259.2977 - val_loss: 310.4473
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 253.0450 - val_loss: 303.6827
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 1ms/step
Mean Squared Error is:  265.95254119492637
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 45ms/step - loss: 1639.1864 - val_loss: 1168.9509
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1620.3940 - val_loss: 1155.8005
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1600.8857 - val_loss: 1142.4381
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1580.6630 - val_loss: 1128.6296
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1558.6571 - val_loss: 1114.1608
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1535.5587 - val_loss: 1098.4807
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1510.3405 - val_loss: 1082.4034
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1484.0020 - val_loss: 1064.8357
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1455.3643 - val_loss: 1046.8499
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1425.1577 - val_loss: 1027.8080
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1393.1477 - val_loss: 1007.6801
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1359.3643 - val_loss: 986.7812
Epoch 13/50
23/23 - 0s - 5ms/step - loss: 1323.6697 - val_loss: 965.2749
Epoch 14/50
23/23 - 0s - 6ms/step - loss: 1287.0824 - val_loss: 942.8669
Epoch 15/50
23/23 - 0s - 5ms/step - loss: 1248.6207 - val_loss: 920.0513
Epoch 16/50
23/23 - 0s - 5ms/step - loss: 1209.7195 - val_loss: 896.2323
Epoch 17/50
23/23 - 0s - 5ms/step - loss: 1169.5337 - val_loss: 872.3921
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1129.0326 - val_loss: 848.4075
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1088.3010 - val_loss: 823.7507
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1046.6919 - val_loss: 799.7027
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1005.1196 - val_loss: 774.9710
Epoch 22/50
23/23 - 0s - 8ms/step - loss: 964.0834 - val_loss: 750.4337
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 922.9169 - val_loss: 726.0584
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 882.4595 - val_loss: 702.1873
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 842.2693 - val_loss: 678.7571
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 803.8253 - val_loss: 655.0952
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 765.1382 - val_loss: 632.5623
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 728.4229 - val_loss: 609.5020
Epoch 29/50
23/23 - 0s - 5ms/step - loss: 692.4332 - val_loss: 588.5263
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 658.2941 - val_loss: 566.7133
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 625.7364 - val_loss: 545.9461
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 594.0173 - val_loss: 526.3073
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 563.6772 - val_loss: 507.7295
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 535.9331 - val_loss: 488.6745
Epoch 35/50
23/23 - 0s - 5ms/step - loss: 509.2211 - val_loss: 472.4275
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 484.8369 - val_loss: 455.5945
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 461.3134 - val_loss: 439.8497
Epoch 38/50
23/23 - 0s - 5ms/step - loss: 439.8889 - val_loss: 425.0487
Epoch 39/50
23/23 - 0s - 5ms/step - loss: 419.6522 - val_loss: 410.8456
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 401.1516 - val_loss: 397.6148
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 383.9891 - val_loss: 385.2580
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 368.1939 - val_loss: 373.2084
Epoch 43/50
23/23 - 0s - 6ms/step - loss: 354.0132 - val_loss: 361.7503
Epoch 44/50
23/23 - 0s - 6ms/step - loss: 340.5205 - val_loss: 351.0330
Epoch 45/50
23/23 - 0s - 6ms/step - loss: 328.5398 - val_loss: 341.4662
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 317.6757 - val_loss: 331.9053
Epoch 47/50
23/23 - 0s - 6ms/step - loss: 307.5795 - val_loss: 323.4513
Epoch 48/50
23/23 - 0s - 7ms/step - loss: 298.7759 - val_loss: 315.0154
Epoch 49/50
23/23 - 0s - 6ms/step - loss: 290.3342 - val_loss: 307.8591
Epoch 50/50
23/23 - 0s - 7ms/step - loss: 283.0582 - val_loss: 300.1920
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 3ms/step
Mean Squared Error is:  285.4524183274753
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 46ms/step - loss: 1622.7075 - val_loss: 1135.6885
Epoch 2/50
23/23 - 0s - 10ms/step - loss: 1602.7456 - val_loss: 1120.6007
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1581.6837 - val_loss: 1104.7976
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1559.1832 - val_loss: 1088.3730
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1534.7542 - val_loss: 1070.9443
Epoch 6/50
23/23 - 0s - 8ms/step - loss: 1508.4050 - val_loss: 1052.6511
Epoch 7/50
23/23 - 0s - 5ms/step - loss: 1479.9550 - val_loss: 1033.1979
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1449.4536 - val_loss: 1012.8120
Epoch 9/50
23/23 - 0s - 8ms/step - loss: 1417.1317 - val_loss: 992.1417
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1382.7523 - val_loss: 969.3315
Epoch 11/50
23/23 - 0s - 8ms/step - loss: 1346.7794 - val_loss: 946.3114
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1308.7286 - val_loss: 923.3358
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1269.9968 - val_loss: 898.5009
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1229.0665 - val_loss: 873.9485
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1187.5917 - val_loss: 848.7078
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1145.1361 - val_loss: 823.1794
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1102.3521 - val_loss: 796.7488
Epoch 18/50
23/23 - 0s - 3ms/step - loss: 1058.6940 - val_loss: 771.1033
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1014.9014 - val_loss: 744.7425
Epoch 20/50
23/23 - 0s - 5ms/step - loss: 971.2199 - val_loss: 718.2307
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 927.6587 - val_loss: 692.2112
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 883.7679 - val_loss: 666.8204
Epoch 23/50
23/23 - 0s - 3ms/step - loss: 841.0342 - val_loss: 640.4049
Epoch 24/50
23/23 - 0s - 3ms/step - loss: 798.5924 - val_loss: 615.5459
Epoch 25/50
23/23 - 0s - 3ms/step - loss: 757.8166 - val_loss: 590.4411
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 717.7880 - val_loss: 566.2371
Epoch 27/50
23/23 - 0s - 3ms/step - loss: 679.5748 - val_loss: 542.7922
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 642.5709 - val_loss: 520.8026
Epoch 29/50
23/23 - 0s - 3ms/step - loss: 607.4940 - val_loss: 497.7110
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 573.6251 - val_loss: 476.0703
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 541.0040 - val_loss: 455.9999
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 510.6125 - val_loss: 435.8344
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 481.1928 - val_loss: 416.9626
Epoch 34/50
23/23 - 0s - 5ms/step - loss: 454.4396 - val_loss: 398.6675
Epoch 35/50
23/23 - 0s - 6ms/step - loss: 428.7445 - val_loss: 381.4004
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 405.2119 - val_loss: 364.9710
Epoch 37/50
23/23 - 0s - 9ms/step - loss: 383.3079 - val_loss: 349.3217
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 363.4816 - val_loss: 334.7347
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 345.1069 - val_loss: 320.9066
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 328.6556 - val_loss: 307.8787
Epoch 41/50
23/23 - 0s - 8ms/step - loss: 313.2833 - val_loss: 296.1448
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 299.9707 - val_loss: 285.0028
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 287.3333 - val_loss: 275.0295
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 276.3521 - val_loss: 265.0606
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 266.2626 - val_loss: 256.2926
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 257.4430 - val_loss: 248.2926
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 249.3564 - val_loss: 241.2426
Epoch 48/50
23/23 - 0s - 5ms/step - loss: 242.1248 - val_loss: 234.6119
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 235.6397 - val_loss: 228.4170
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 229.8597 - val_loss: 222.3080
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  225.3507834595722
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 39ms/step - loss: 1622.9220 - val_loss: 1180.9952
Epoch 2/50
23/23 - 0s - 10ms/step - loss: 1605.0566 - val_loss: 1170.5688
Epoch 3/50
23/23 - 0s - 5ms/step - loss: 1585.6893 - val_loss: 1159.4075
Epoch 4/50
23/23 - 0s - 5ms/step - loss: 1564.4033 - val_loss: 1147.5405
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1541.6891 - val_loss: 1134.5688
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1516.9347 - val_loss: 1120.9390
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1490.4988 - val_loss: 1106.2487
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1461.9974 - val_loss: 1090.9189
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1431.8544 - val_loss: 1074.4985
Epoch 10/50
23/23 - 0s - 3ms/step - loss: 1400.1123 - val_loss: 1057.3984
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1366.6174 - val_loss: 1039.2107
Epoch 12/50
23/23 - 0s - 5ms/step - loss: 1331.3698 - val_loss: 1020.6119
Epoch 13/50
23/23 - 0s - 8ms/step - loss: 1295.4364 - val_loss: 1000.4614
Epoch 14/50
23/23 - 0s - 5ms/step - loss: 1257.4302 - val_loss: 979.8297
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1218.4327 - val_loss: 958.4798
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1178.2268 - val_loss: 936.8323
Epoch 17/50
23/23 - 0s - 5ms/step - loss: 1137.6909 - val_loss: 914.2050
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1095.3499 - val_loss: 891.2552
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1053.8759 - val_loss: 868.0278
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1011.5107 - val_loss: 844.5499
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 969.4330 - val_loss: 820.6367
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 927.9050 - val_loss: 796.0413
Epoch 23/50
23/23 - 0s - 5ms/step - loss: 886.3796 - val_loss: 772.0515
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 845.6451 - val_loss: 748.4531
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 805.7154 - val_loss: 724.1262
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 767.3226 - val_loss: 699.4969
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 728.6395 - val_loss: 675.5431
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 692.1025 - val_loss: 652.5294
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 656.6918 - val_loss: 628.9309
Epoch 30/50
23/23 - 0s - 3ms/step - loss: 622.5136 - val_loss: 606.4847
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 590.0908 - val_loss: 584.2994
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 558.9960 - val_loss: 562.3456
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 529.9881 - val_loss: 541.1137
Epoch 34/50
23/23 - 0s - 6ms/step - loss: 502.6537 - val_loss: 520.7858
Epoch 35/50
23/23 - 0s - 6ms/step - loss: 476.9662 - val_loss: 500.7327
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 452.9841 - val_loss: 481.5345
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 430.7094 - val_loss: 463.1646
Epoch 38/50
23/23 - 0s - 8ms/step - loss: 409.9671 - val_loss: 445.2309
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 391.4625 - val_loss: 427.7956
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 374.0941 - val_loss: 411.3815
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 358.2240 - val_loss: 396.9647
Epoch 42/50
23/23 - 0s - 5ms/step - loss: 344.4474 - val_loss: 381.5580
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 331.5349 - val_loss: 367.9258
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 319.9185 - val_loss: 355.2485
Epoch 45/50
23/23 - 0s - 3ms/step - loss: 309.6345 - val_loss: 342.8839
Epoch 46/50
23/23 - 0s - 3ms/step - loss: 300.1277 - val_loss: 331.1697
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 291.5416 - val_loss: 320.0515
Epoch 48/50
23/23 - 0s - 3ms/step - loss: 283.9365 - val_loss: 310.0946
Epoch 49/50
23/23 - 0s - 3ms/step - loss: 277.1715 - val_loss: 300.3795
Epoch 50/50
23/23 - 0s - 3ms/step - loss: 270.9482 - val_loss: 292.1482
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 1ms/step
Mean Squared Error is:  275.0225434433751
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 51ms/step - loss: 1741.8572 - val_loss: 1253.5083
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1724.0350 - val_loss: 1244.8717
Epoch 3/50
23/23 - 0s - 5ms/step - loss: 1706.8958 - val_loss: 1237.1141
Epoch 4/50
23/23 - 0s - 6ms/step - loss: 1690.7881 - val_loss: 1229.8112
Epoch 5/50
23/23 - 0s - 5ms/step - loss: 1675.1302 - val_loss: 1223.0531
Epoch 6/50
23/23 - 0s - 6ms/step - loss: 1659.9869 - val_loss: 1216.6566
Epoch 7/50
23/23 - 0s - 6ms/step - loss: 1645.0729 - val_loss: 1210.3297
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1630.3795 - val_loss: 1204.2516
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1615.5706 - val_loss: 1198.5013
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1600.8510 - val_loss: 1192.6281
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1585.8518 - val_loss: 1186.6904
Epoch 12/50
23/23 - 0s - 7ms/step - loss: 1570.4844 - val_loss: 1180.7531
Epoch 13/50
23/23 - 0s - 5ms/step - loss: 1554.7202 - val_loss: 1174.4437
Epoch 14/50
23/23 - 0s - 6ms/step - loss: 1537.8656 - val_loss: 1167.9104
Epoch 15/50
23/23 - 0s - 5ms/step - loss: 1520.3915 - val_loss: 1160.8104
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1502.1141 - val_loss: 1153.1392
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1482.3420 - val_loss: 1144.4092
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1460.8800 - val_loss: 1134.6760
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1437.8436 - val_loss: 1123.6807
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1412.9213 - val_loss: 1111.4465
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1386.1635 - val_loss: 1097.8782
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1356.8925 - val_loss: 1083.1404
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1325.3912 - val_loss: 1067.2118
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1291.7977 - val_loss: 1049.4729
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1255.8376 - val_loss: 1031.2292
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1218.1165 - val_loss: 1011.6837
Epoch 27/50
23/23 - 0s - 5ms/step - loss: 1179.2334 - val_loss: 991.0394
Epoch 28/50
23/23 - 0s - 5ms/step - loss: 1138.6846 - val_loss: 969.9733
Epoch 29/50
23/23 - 0s - 5ms/step - loss: 1097.7157 - val_loss: 947.7625
Epoch 30/50
23/23 - 0s - 6ms/step - loss: 1055.6873 - val_loss: 925.0535
Epoch 31/50
23/23 - 0s - 5ms/step - loss: 1014.0234 - val_loss: 901.9489
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 972.4926 - val_loss: 877.8707
Epoch 33/50
23/23 - 0s - 5ms/step - loss: 930.6223 - val_loss: 854.3141
Epoch 34/50
23/23 - 0s - 8ms/step - loss: 890.4849 - val_loss: 829.3936
Epoch 35/50
23/23 - 0s - 8ms/step - loss: 849.6050 - val_loss: 805.7023
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 811.2085 - val_loss: 781.2204
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 772.6844 - val_loss: 757.2910
Epoch 38/50
23/23 - 0s - 5ms/step - loss: 736.1550 - val_loss: 733.0896
Epoch 39/50
23/23 - 0s - 6ms/step - loss: 700.4700 - val_loss: 709.5688
Epoch 40/50
23/23 - 0s - 7ms/step - loss: 666.1947 - val_loss: 686.6911
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 634.0745 - val_loss: 663.5205
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 603.0682 - val_loss: 641.2419
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 573.5818 - val_loss: 619.3351
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 545.4205 - val_loss: 598.3463
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 519.3826 - val_loss: 577.3917
Epoch 46/50
23/23 - 0s - 5ms/step - loss: 493.8980 - val_loss: 557.8448
Epoch 47/50
23/23 - 0s - 6ms/step - loss: 470.7440 - val_loss: 538.6393
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 448.9512 - val_loss: 519.7310
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 427.9589 - val_loss: 502.0475
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 409.2095 - val_loss: 484.1445
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  424.50476485462025
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 47ms/step - loss: 1729.6361 - val_loss: 1229.3546
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1709.2800 - val_loss: 1217.0713
Epoch 3/50
23/23 - 0s - 7ms/step - loss: 1689.4001 - val_loss: 1204.4075
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1669.3549 - val_loss: 1191.5591
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1649.0300 - val_loss: 1178.6670
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1628.7648 - val_loss: 1165.3439
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1607.1332 - val_loss: 1151.3215
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1585.4645 - val_loss: 1136.4200
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1561.9036 - val_loss: 1121.5369
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1537.7388 - val_loss: 1105.6324
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1512.4149 - val_loss: 1088.8854
Epoch 12/50
23/23 - 0s - 5ms/step - loss: 1485.1783 - val_loss: 1071.6331
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1456.9681 - val_loss: 1052.9003
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1426.7740 - val_loss: 1033.6268
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1395.2625 - val_loss: 1013.9726
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1362.5852 - val_loss: 993.2889
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1328.2559 - val_loss: 972.0045
Epoch 18/50
23/23 - 0s - 5ms/step - loss: 1293.0049 - val_loss: 949.9869
Epoch 19/50
23/23 - 0s - 9ms/step - loss: 1256.6483 - val_loss: 928.1059
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1219.6997 - val_loss: 905.1821
Epoch 21/50
23/23 - 0s - 10ms/step - loss: 1182.3223 - val_loss: 882.0608
Epoch 22/50
23/23 - 0s - 5ms/step - loss: 1143.8759 - val_loss: 859.2352
Epoch 23/50
23/23 - 0s - 7ms/step - loss: 1105.5885 - val_loss: 835.6097
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1067.0217 - val_loss: 812.1716
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1029.1807 - val_loss: 788.4362
Epoch 26/50
23/23 - 0s - 8ms/step - loss: 990.3920 - val_loss: 765.0484
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 952.3337 - val_loss: 741.6092
Epoch 28/50
23/23 - 0s - 5ms/step - loss: 915.1746 - val_loss: 717.9603
Epoch 29/50
23/23 - 0s - 7ms/step - loss: 878.1256 - val_loss: 694.8917
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 841.9874 - val_loss: 672.2176
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 807.1628 - val_loss: 649.3588
```

```
Epoch 32/50
23/23 - 0s - 8ms/step - loss: 772.6633 - val_loss: 627.2195
Epoch 33/50
23/23 - 0s - 5ms/step - loss: 739.4373 - val_loss: 605.9800
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 707.4992 - val_loss: 584.6947
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 676.6522 - val_loss: 564.3718
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 646.7678 - val_loss: 544.2872
Epoch 37/50
23/23 - 0s - 5ms/step - loss: 618.4199 - val_loss: 524.8787
Epoch 38/50
23/23 - 0s - 6ms/step - loss: 591.1206 - val_loss: 506.4337
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 565.6406 - val_loss: 487.9835
Epoch 40/50
23/23 - 0s - 8ms/step - loss: 541.0209 - val_loss: 470.6055
Epoch 41/50
23/23 - 0s - 5ms/step - loss: 517.9046 - val_loss: 453.6213
Epoch 42/50
23/23 - 0s - 5ms/step - loss: 496.0469 - val_loss: 438.1832
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 475.7642 - val_loss: 422.6971
Epoch 44/50
23/23 - 0s - 5ms/step - loss: 456.5223 - val_loss: 408.1149
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 438.7115 - val_loss: 394.5309
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 421.9091 - val_loss: 381.9017
Epoch 47/50
23/23 - 0s - 6ms/step - loss: 406.8423 - val_loss: 369.3676
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 392.4905 - val_loss: 358.1997
Epoch 49/50
23/23 - 0s - 8ms/step - loss: 379.3128 - val_loss: 347.3826
Epoch 50/50
23/23 - 0s - 5ms/step - loss: 367.0905 - val_loss: 336.9551
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  353.4954743257456
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 52ms/step - loss: 1660.5565 - val_loss: 1198.9648
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1643.6113 - val_loss: 1187.4426
Epoch 3/50
23/23 - 0s - 5ms/step - loss: 1625.5325 - val_loss: 1175.8647
Epoch 4/50
23/23 - 0s - 6ms/step - loss: 1606.6144 - val_loss: 1163.4337
Epoch 5/50
23/23 - 0s - 5ms/step - loss: 1586.5614 - val_loss: 1150.1257
Epoch 6/50
23/23 - 0s - 6ms/step - loss: 1565.1108 - val_loss: 1136.3069
Epoch 7/50
23/23 - 0s - 6ms/step - loss: 1542.3698 - val_loss: 1121.5221
Epoch 8/50
23/23 - 0s - 5ms/step - loss: 1518.0659 - val_loss: 1105.8619
Epoch 9/50
23/23 - 0s - 8ms/step - loss: 1492.2455 - val_loss: 1089.4261
Epoch 10/50
23/23 - 0s - 5ms/step - loss: 1464.6321 - val_loss: 1072.4388
Epoch 11/50
23/23 - 0s - 6ms/step - loss: 1435.5294 - val_loss: 1054.3010
Epoch 12/50
23/23 - 0s - 5ms/step - loss: 1404.7219 - val_loss: 1035.3285
Epoch 13/50
23/23 - 0s - 5ms/step - loss: 1372.6559 - val_loss: 1015.6944
Epoch 14/50
23/23 - 0s - 5ms/step - loss: 1339.2225 - val_loss: 995.6890
Epoch 15/50
23/23 - 0s - 5ms/step - loss: 1305.0515 - val_loss: 974.4963
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1268.9875 - val_loss: 952.5573
Epoch 17/50
23/23 - 0s - 5ms/step - loss: 1232.7086 - val_loss: 930.7545
Epoch 18/50
23/23 - 0s - 5ms/step - loss: 1195.1912 - val_loss: 908.4760
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1156.8837 - val_loss: 885.8568
Epoch 20/50
23/23 - 0s - 5ms/step - loss: 1118.8993 - val_loss: 862.7512
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1080.0925 - val_loss: 839.2626
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1041.9602 - val_loss: 815.9557
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1003.2013 - val_loss: 792.9885
Epoch 24/50
23/23 - 0s - 10ms/step - loss: 965.8160 - val_loss: 769.1160
Epoch 25/50
23/23 - 0s - 5ms/step - loss: 927.8001 - val_loss: 746.0118
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 890.7570 - val_loss: 723.4591
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 854.2077 - val_loss: 700.7916
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 819.3848 - val_loss: 677.7560
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 784.1925 - val_loss: 656.1209
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 751.0253 - val_loss: 634.5007
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 718.2202 - val_loss: 613.4016
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 686.7807 - val_loss: 592.8195
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 656.6992 - val_loss: 572.4474
Epoch 34/50
23/23 - 0s - 5ms/step - loss: 627.4592 - val_loss: 553.1744
Epoch 35/50
23/23 - 0s - 5ms/step - loss: 599.8638 - val_loss: 534.0085
Epoch 36/50
23/23 - 0s - 7ms/step - loss: 573.4785 - val_loss: 515.7024
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 548.4600 - val_loss: 497.7338
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 524.6001 - val_loss: 481.4536
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 502.2546 - val_loss: 464.8906
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 481.4997 - val_loss: 449.2877
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 461.5070 - val_loss: 434.2040
Epoch 42/50
23/23 - 0s - 7ms/step - loss: 443.2711 - val_loss: 420.0750
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 426.0143 - val_loss: 406.3020
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 409.5874 - val_loss: 394.4378
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 394.9972 - val_loss: 382.1497
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 381.0443 - val_loss: 370.3701
Epoch 47/50
23/23 - 0s - 5ms/step - loss: 367.7874 - val_loss: 359.9962
Epoch 48/50
23/23 - 0s - 6ms/step - loss: 355.9501 - val_loss: 349.9197
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 344.7896 - val_loss: 340.7445
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 334.6684 - val_loss: 331.9060
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  330.04006435315677
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 45ms/step - loss: 1701.2880 - val_loss: 1234.5203
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1682.2784 - val_loss: 1221.2936
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1663.2633 - val_loss: 1208.2715
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1644.2297 - val_loss: 1194.9467
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1624.7231 - val_loss: 1181.4429
Epoch 6/50
23/23 - 0s - 7ms/step - loss: 1604.6614 - val_loss: 1167.6462
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1583.9320 - val_loss: 1153.9594
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1562.3619 - val_loss: 1138.9926
Epoch 9/50
23/23 - 0s - 5ms/step - loss: 1539.6711 - val_loss: 1124.2355
Epoch 10/50
23/23 - 0s - 5ms/step - loss: 1515.8387 - val_loss: 1109.4027
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1491.3605 - val_loss: 1094.0930
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1465.2500 - val_loss: 1077.7205
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1438.0135 - val_loss: 1060.8706
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1408.5409 - val_loss: 1044.2494
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1378.1315 - val_loss: 1026.6967
Epoch 16/50
23/23 - 0s - 5ms/step - loss: 1345.8883 - val_loss: 1007.8646
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1312.6016 - val_loss: 988.6764
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1278.3121 - val_loss: 969.3652
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1242.5717 - val_loss: 948.6663
Epoch 20/50
23/23 - 0s - 5ms/step - loss: 1206.0062 - val_loss: 927.6520
Epoch 21/50
23/23 - 0s - 5ms/step - loss: 1169.2351 - val_loss: 906.0470
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1131.1360 - val_loss: 883.5742
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1092.8677 - val_loss: 861.3687
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1054.4823 - val_loss: 838.4026
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1015.8002 - val_loss: 815.2618
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 977.4272 - val_loss: 791.4811
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 939.8918 - val_loss: 767.0712
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 901.4955 - val_loss: 743.2894
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 864.5266 - val_loss: 719.6777
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 828.6237 - val_loss: 695.9018
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 793.4233 - val_loss: 672.1403
```

```
Epoch 32/50
23/23 - 0s - 3ms/step - loss: 759.1397 - val_loss: 648.6063
Epoch 33/50
23/23 - 0s - 3ms/step - loss: 726.0364 - val_loss: 625.2164
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 693.8722 - val_loss: 602.5409
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 663.3966 - val_loss: 580.3681
Epoch 36/50
23/23 - 0s - 6ms/step - loss: 633.7117 - val_loss: 558.6570
Epoch 37/50
23/23 - 0s - 6ms/step - loss: 605.3715 - val_loss: 537.4911
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 578.5450 - val_loss: 516.7997
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 552.8667 - val_loss: 496.7086
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 528.6693 - val_loss: 477.8900
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 505.8000 - val_loss: 459.2751
Epoch 42/50
23/23 - 0s - 5ms/step - loss: 484.3770 - val_loss: 442.0458
Epoch 43/50
23/23 - 0s - 5ms/step - loss: 464.2662 - val_loss: 425.6899
Epoch 44/50
23/23 - 0s - 7ms/step - loss: 445.2889 - val_loss: 410.0667
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 427.5388 - val_loss: 395.4908
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 411.1741 - val_loss: 381.4225
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 395.6137 - val_loss: 368.4517
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 381.4829 - val_loss: 355.8371
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 368.2495 - val_loss: 344.7474
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 356.1132 - val_loss: 333.4479
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  344.89886301163693
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 44ms/step - loss: 1735.9568 - val_loss: 1243.4600
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1719.3977 - val_loss: 1234.6613
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1704.1134 - val_loss: 1226.0785
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1689.4122 - val_loss: 1217.8965
Epoch 5/50
23/23 - 0s - 5ms/step - loss: 1675.4539 - val_loss: 1209.7030
Epoch 6/50
23/23 - 0s - 7ms/step - loss: 1661.5754 - val_loss: 1201.5828
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1647.7280 - val_loss: 1193.4696
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1633.7734 - val_loss: 1185.2581
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1619.4326 - val_loss: 1176.9790
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1604.5433 - val_loss: 1168.3979
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1588.8207 - val_loss: 1159.6038
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1572.2970 - val_loss: 1150.4586
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1554.7871 - val_loss: 1141.1744
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1536.0255 - val_loss: 1131.5334
Epoch 15/50
23/23 - 0s - 5ms/step - loss: 1516.0132 - val_loss: 1121.2644
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1494.9001 - val_loss: 1110.6793
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1472.7926 - val_loss: 1099.5050
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1448.9860 - val_loss: 1087.9655
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1424.6498 - val_loss: 1075.8004
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1398.3851 - val_loss: 1063.2527
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1370.7140 - val_loss: 1049.7419
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1341.7253 - val_loss: 1035.5927
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1311.3201 - val_loss: 1020.8284
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1279.3998 - val_loss: 1005.4554
Epoch 25/50
23/23 - 0s - 5ms/step - loss: 1246.5480 - val_loss: 989.4972
Epoch 26/50
23/23 - 0s - 6ms/step - loss: 1212.2168 - val_loss: 973.2343
Epoch 27/50
23/23 - 0s - 6ms/step - loss: 1177.1967 - val_loss: 956.1298
Epoch 28/50
23/23 - 0s - 5ms/step - loss: 1141.4706 - val_loss: 938.4536
Epoch 29/50
23/23 - 0s - 6ms/step - loss: 1105.5436 - val_loss: 920.6065
Epoch 30/50
23/23 - 0s - 5ms/step - loss: 1069.3112 - val_loss: 902.3308
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 1032.6744 - val_loss: 883.8003
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 996.4260 - val_loss: 864.4840
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 959.8294 - val_loss: 845.3588
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 923.2042 - val_loss: 825.9708
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 887.8329 - val_loss: 806.5632
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 852.1096 - val_loss: 786.6024
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 817.3639 - val_loss: 766.7692
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 782.9788 - val_loss: 746.7209
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 749.5569 - val_loss: 727.4456
Epoch 40/50
23/23 - 0s - 5ms/step - loss: 717.5885 - val_loss: 707.4742
Epoch 41/50
23/23 - 0s - 6ms/step - loss: 686.5974 - val_loss: 688.2671
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 657.4772 - val_loss: 668.7811
Epoch 43/50
23/23 - 0s - 7ms/step - loss: 628.9310 - val_loss: 650.0869
Epoch 44/50
23/23 - 0s - 7ms/step - loss: 602.3856 - val_loss: 631.5385
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 577.0437 - val_loss: 613.8065
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 553.6328 - val_loss: 595.7659
Epoch 47/50
23/23 - 0s - 5ms/step - loss: 531.0649 - val_loss: 578.8024
Epoch 48/50
23/23 - 0s - 5ms/step - loss: 509.9292 - val_loss: 562.0458
Epoch 49/50
23/23 - 0s - 7ms/step - loss: 489.6615 - val_loss: 545.8231
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 470.8134 - val_loss: 529.5723
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  481.70965708217943
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 46ms/step - loss: 1667.6519 - val_loss: 1194.5966
Epoch 2/50
23/23 - 0s - 5ms/step - loss: 1651.3651 - val_loss: 1182.4622
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1634.6683 - val_loss: 1170.2264
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1616.9163 - val_loss: 1157.9265
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1597.9735 - val_loss: 1145.4340
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1577.8986 - val_loss: 1132.7527
Epoch 7/50
23/23 - 0s - 5ms/step - loss: 1556.3685 - val_loss: 1119.8025
Epoch 8/50
23/23 - 0s - 5ms/step - loss: 1533.7878 - val_loss: 1106.6324
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1509.6803 - val_loss: 1092.7837
Epoch 10/50
23/23 - 0s - 5ms/step - loss: 1483.7072 - val_loss: 1078.9344
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1456.0557 - val_loss: 1064.3488
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1427.1604 - val_loss: 1050.2533
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1396.7428 - val_loss: 1034.6857
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1365.0486 - val_loss: 1019.2159
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1332.1926 - val_loss: 1003.5653
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1298.6353 - val_loss: 987.4081
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1263.9966 - val_loss: 970.8016
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1228.8342 - val_loss: 953.7820
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1192.6429 - val_loss: 937.1035
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1156.5797 - val_loss: 919.2957
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1119.9122 - val_loss: 901.5214
Epoch 22/50
23/23 - 0s - 5ms/step - loss: 1083.2800 - val_loss: 883.3347
Epoch 23/50
23/23 - 0s - 5ms/step - loss: 1046.3569 - val_loss: 864.2538
Epoch 24/50
23/23 - 0s - 5ms/step - loss: 1008.8533 - val_loss: 844.4916
Epoch 25/50
23/23 - 0s - 5ms/step - loss: 971.4307 - val_loss: 824.2339
Epoch 26/50
23/23 - 0s - 5ms/step - loss: 933.8062 - val_loss: 803.9799
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 896.5023 - val_loss: 782.5284
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 858.9474 - val_loss: 760.5731
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 821.6641 - val_loss: 738.4271
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 784.7929 - val_loss: 715.7765
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 748.7401 - val_loss: 692.4181
```

```
Epoch 32/50
23/23 - 0s - 5ms/step - loss: 713.2712 - val_loss: 668.6320
Epoch 33/50
23/23 - 0s - 5ms/step - loss: 678.8491 - val_loss: 644.3708
Epoch 34/50
23/23 - 0s - 5ms/step - loss: 644.9434 - val_loss: 620.4324
Epoch 35/50
23/23 - 0s - 5ms/step - loss: 612.2767 - val_loss: 596.7675
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 580.9471 - val_loss: 573.5874
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 550.9384 - val_loss: 550.0522
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 522.2444 - val_loss: 528.0848
Epoch 39/50
23/23 - 0s - 5ms/step - loss: 494.8033 - val_loss: 506.4928
Epoch 40/50
23/23 - 0s - 5ms/step - loss: 469.2408 - val_loss: 485.4103
Epoch 41/50
23/23 - 0s - 7ms/step - loss: 444.9510 - val_loss: 464.9678
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 422.0133 - val_loss: 446.1573
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 401.2199 - val_loss: 427.3468
Epoch 44/50
23/23 - 0s - 7ms/step - loss: 381.2285 - val_loss: 409.5403
Epoch 45/50
23/23 - 0s - 6ms/step - loss: 363.1347 - val_loss: 393.2865
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 346.7737 - val_loss: 377.5727
Epoch 47/50
23/23 - 0s - 10ms/step - loss: 331.7455 - val_loss: 362.6979
Epoch 48/50
23/23 - 0s - 6ms/step - loss: 317.9207 - val_loss: 349.3377
Epoch 49/50
23/23 - 0s - 6ms/step - loss: 305.4268 - val_loss: 336.9201
Epoch 50/50
23/23 - 0s - 5ms/step - loss: 294.5008 - val_loss: 324.6092
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  299.49258200129174
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 44ms/step - loss: 1678.6101 - val_loss: 1198.7604
Epoch 2/50
23/23 - 0s - 5ms/step - loss: 1661.6989 - val_loss: 1185.5104
Epoch 3/50
23/23 - 0s - 6ms/step - loss: 1644.8483 - val_loss: 1171.9884
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1627.9406 - val_loss: 1158.1727
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1610.9596 - val_loss: 1143.4915
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1593.1458 - val_loss: 1128.5619
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1574.9532 - val_loss: 1112.9135
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1555.9501 - val_loss: 1096.5901
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1536.1604 - val_loss: 1079.9221
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1515.8536 - val_loss: 1062.5896
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1494.4893 - val_loss: 1044.6388
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1472.4546 - val_loss: 1026.6277
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1449.9463 - val_loss: 1007.2774
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1426.2047 - val_loss: 988.3625
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1401.9875 - val_loss: 968.3536
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1376.6959 - val_loss: 948.8618
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1350.8722 - val_loss: 928.8696
Epoch 18/50
23/23 - 0s - 5ms/step - loss: 1324.0508 - val_loss: 908.8361
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1296.9271 - val_loss: 888.3185
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1269.0997 - val_loss: 868.3882
Epoch 21/50
23/23 - 0s - 5ms/step - loss: 1240.7662 - val_loss: 848.0379
Epoch 22/50
23/23 - 0s - 6ms/step - loss: 1212.0068 - val_loss: 828.5375
Epoch 23/50
23/23 - 0s - 5ms/step - loss: 1182.8779 - val_loss: 808.4869
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1153.4150 - val_loss: 789.0465
Epoch 25/50
23/23 - 0s - 10ms/step - loss: 1123.7744 - val_loss: 769.2744
Epoch 26/50
23/23 - 0s - 5ms/step - loss: 1093.4403 - val_loss: 750.4634
Epoch 27/50
23/23 - 0s - 5ms/step - loss: 1063.4161 - val_loss: 731.2786
Epoch 28/50
23/23 - 0s - 5ms/step - loss: 1033.2185 - val_loss: 712.6670
Epoch 29/50
23/23 - 0s - 5ms/step - loss: 1002.9389 - val_loss: 694.3905
Epoch 30/50
23/23 - 0s - 5ms/step - loss: 973.1683 - val_loss: 676.7684
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 943.4233 - val_loss: 659.0545
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 914.1095 - val_loss: 642.0152
Epoch 33/50
23/23 - 0s - 5ms/step - loss: 884.7003 - val_loss: 625.1744
Epoch 34/50
23/23 - 0s - 5ms/step - loss: 855.0768 - val_loss: 609.2754
Epoch 35/50
23/23 - 0s - 5ms/step - loss: 826.0852 - val_loss: 593.5840
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 797.6615 - val_loss: 578.0218
Epoch 37/50
23/23 - 0s - 5ms/step - loss: 769.0968 - val_loss: 562.9216
Epoch 38/50
23/23 - 0s - 5ms/step - loss: 741.1080 - val_loss: 548.5444
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 712.9897 - val_loss: 534.3782
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 685.4625 - val_loss: 520.7686
Epoch 41/50
23/23 - 0s - 5ms/step - loss: 657.9012 - val_loss: 507.1287
Epoch 42/50
23/23 - 0s - 5ms/step - loss: 630.4836 - val_loss: 493.9032
Epoch 43/50
23/23 - 0s - 8ms/step - loss: 602.9311 - val_loss: 481.2678
Epoch 44/50
23/23 - 0s - 6ms/step - loss: 576.7883 - val_loss: 468.6276
Epoch 45/50
23/23 - 0s - 5ms/step - loss: 550.3568 - val_loss: 456.4646
Epoch 46/50
23/23 - 0s - 5ms/step - loss: 525.8625 - val_loss: 444.7900
Epoch 47/50
23/23 - 0s - 5ms/step - loss: 501.7233 - val_loss: 433.4107
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 478.9840 - val_loss: 422.3111
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 456.9175 - val_loss: 412.0016
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 436.2255 - val_loss: 401.6919
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  418.3168343508188
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 45ms/step - loss: 1716.7385 - val_loss: 1226.6030
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1702.1241 - val_loss: 1217.4662
Epoch 3/50
23/23 - 0s - 5ms/step - loss: 1688.0385 - val_loss: 1208.5615
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1674.1503 - val_loss: 1199.6793
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1660.3206 - val_loss: 1190.4617
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1646.1160 - val_loss: 1180.8955
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1631.3246 - val_loss: 1170.7610
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1615.3667 - val_loss: 1159.8977
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1597.9502 - val_loss: 1147.9966
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1578.7792 - val_loss: 1135.4739
Epoch 11/50
23/23 - 0s - 5ms/step - loss: 1557.7938 - val_loss: 1121.5520
Epoch 12/50
23/23 - 0s - 5ms/step - loss: 1534.7710 - val_loss: 1106.5331
Epoch 13/50
23/23 - 0s - 5ms/step - loss: 1509.3641 - val_loss: 1090.6394
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1481.5834 - val_loss: 1073.6481
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1452.2905 - val_loss: 1055.2273
Epoch 16/50
23/23 - 0s - 5ms/step - loss: 1420.3303 - val_loss: 1036.1013
Epoch 17/50
23/23 - 0s - 5ms/step - loss: 1387.6210 - val_loss: 1016.2906
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1352.9290 - val_loss: 994.9997
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1316.5370 - val_loss: 973.5201
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1279.3131 - val_loss: 951.1703
Epoch 21/50
23/23 - 0s - 5ms/step - loss: 1240.9354 - val_loss: 928.6490
Epoch 22/50
23/23 - 0s - 5ms/step - loss: 1201.7412 - val_loss: 905.6164
Epoch 23/50
23/23 - 0s - 8ms/step - loss: 1161.4442 - val_loss: 882.2531
Epoch 24/50
23/23 - 0s - 5ms/step - loss: 1120.5128 - val_loss: 858.2597
Epoch 25/50
23/23 - 0s - 6ms/step - loss: 1078.4136 - val_loss: 834.2502
Epoch 26/50
23/23 - 0s - 6ms/step - loss: 1036.0280 - val_loss: 809.9651
Epoch 27/50
23/23 - 0s - 6ms/step - loss: 993.1904 - val_loss: 786.1025
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 950.8364 - val_loss: 761.7145
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 908.1863 - val_loss: 738.2924
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 866.8098 - val_loss: 714.2763
Epoch 31/50
23/23 - 0s - 5ms/step - loss: 825.2313 - val_loss: 691.3235
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 785.3494 - val_loss: 668.4966
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 746.8240 - val_loss: 646.6448
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 709.4054 - val_loss: 624.0011
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 673.6009 - val_loss: 603.6101
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 639.9993 - val_loss: 582.1427
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 607.2281 - val_loss: 562.4839
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 576.6189 - val_loss: 542.8052
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 547.4894 - val_loss: 524.7836
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 520.2281 - val_loss: 507.0799
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 494.8083 - val_loss: 490.0278
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 470.4886 - val_loss: 473.1830
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 448.0254 - val_loss: 457.9661
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 427.2521 - val_loss: 442.5814
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 407.4544 - val_loss: 427.7558
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 389.3564 - val_loss: 413.4955
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 372.5948 - val_loss: 400.9367
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 357.2164 - val_loss: 388.2184
Epoch 49/50
23/23 - 0s - 8ms/step - loss: 342.9201 - val_loss: 376.9621
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 329.7673 - val_loss: 365.6197
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  335.7781250833059
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 48ms/step - loss: 1706.2108 - val_loss: 1248.4713
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1687.1835 - val_loss: 1237.3524
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1668.1571 - val_loss: 1226.4220
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1649.0928 - val_loss: 1215.3605
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1629.2756 - val_loss: 1204.4991
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1609.2169 - val_loss: 1193.6885
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1588.4164 - val_loss: 1182.4204
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1566.5184 - val_loss: 1170.6343
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1543.2006 - val_loss: 1158.2227
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1519.1147 - val_loss: 1145.3820
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1493.2145 - val_loss: 1131.8417
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1466.0857 - val_loss: 1117.4995
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1437.3060 - val_loss: 1102.8406
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1407.6984 - val_loss: 1087.4860
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1376.6404 - val_loss: 1071.6829
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1344.4990 - val_loss: 1055.8323
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1311.5651 - val_loss: 1039.4623
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1277.9294 - val_loss: 1022.7330
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1243.4487 - val_loss: 1005.7087
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1208.4580 - val_loss: 988.5443
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1173.6864 - val_loss: 971.0250
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1138.4060 - val_loss: 953.8655
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1103.6842 - val_loss: 936.2325
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1069.1185 - val_loss: 918.5690
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1034.4200 - val_loss: 901.2386
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1000.9775 - val_loss: 883.4789
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 967.3903 - val_loss: 866.5148
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 935.4053 - val_loss: 848.8989
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 902.9979 - val_loss: 831.6550
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 871.7905 - val_loss: 814.5316
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 841.7209 - val_loss: 797.4477
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 812.4449 - val_loss: 781.0585
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 784.3923 - val_loss: 764.4640
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 757.0220 - val_loss: 747.9243
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 731.1646 - val_loss: 731.4294
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 705.2402 - val_loss: 715.6987
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 681.1299 - val_loss: 698.8804
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 657.4109 - val_loss: 683.0566
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 634.2869 - val_loss: 666.4499
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 612.0005 - val_loss: 649.8295
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 590.2905 - val_loss: 633.6104
Epoch 42/50
23/23 - 0s - 5ms/step - loss: 569.3292 - val_loss: 616.5277
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 548.7318 - val_loss: 600.0291
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 528.7908 - val_loss: 582.6461
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 509.2321 - val_loss: 565.4384
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 490.0956 - val_loss: 548.0581
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 471.4892 - val_loss: 531.5131
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 453.8201 - val_loss: 514.2521
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 436.3466 - val_loss: 497.3845
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 419.6484 - val_loss: 480.3207
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  431.4931885957659
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 40ms/step - loss: 1690.5974 - val_loss: 1181.0668
Epoch 2/50
23/23 - 0s - 5ms/step - loss: 1674.5806 - val_loss: 1168.7153
Epoch 3/50
23/23 - 0s - 8ms/step - loss: 1658.1526 - val_loss: 1155.9296
Epoch 4/50
23/23 - 0s - 3ms/step - loss: 1640.9806 - val_loss: 1142.3547
Epoch 5/50
23/23 - 0s - 3ms/step - loss: 1622.4506 - val_loss: 1127.7522
Epoch 6/50
23/23 - 0s - 3ms/step - loss: 1602.7631 - val_loss: 1112.0227
Epoch 7/50
23/23 - 0s - 3ms/step - loss: 1581.7620 - val_loss: 1095.0723
Epoch 8/50
23/23 - 0s - 3ms/step - loss: 1559.0142 - val_loss: 1077.2793
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1534.6049 - val_loss: 1058.3350
Epoch 10/50
23/23 - 0s - 3ms/step - loss: 1508.1697 - val_loss: 1038.5214
Epoch 11/50
23/23 - 0s - 3ms/step - loss: 1479.7067 - val_loss: 1017.4241
Epoch 12/50
23/23 - 0s - 3ms/step - loss: 1449.1608 - val_loss: 996.0574
Epoch 13/50
23/23 - 0s - 3ms/step - loss: 1416.3855 - val_loss: 973.2583
Epoch 14/50
23/23 - 0s - 3ms/step - loss: 1381.8065 - val_loss: 949.7476
Epoch 15/50
23/23 - 0s - 3ms/step - loss: 1345.9237 - val_loss: 924.8696
Epoch 16/50
23/23 - 0s - 3ms/step - loss: 1308.5920 - val_loss: 899.2520
Epoch 17/50
23/23 - 0s - 3ms/step - loss: 1269.2722 - val_loss: 873.4706
Epoch 18/50
23/23 - 0s - 3ms/step - loss: 1229.4762 - val_loss: 847.0939
Epoch 19/50
23/23 - 0s - 3ms/step - loss: 1187.8854 - val_loss: 820.2487
Epoch 20/50
23/23 - 0s - 3ms/step - loss: 1145.9889 - val_loss: 792.2126
Epoch 21/50
23/23 - 0s - 3ms/step - loss: 1102.8401 - val_loss: 764.6996
Epoch 22/50
23/23 - 0s - 3ms/step - loss: 1059.8069 - val_loss: 737.7182
Epoch 23/50
23/23 - 0s - 3ms/step - loss: 1016.7842 - val_loss: 709.7805
Epoch 24/50
23/23 - 0s - 5ms/step - loss: 973.3049 - val_loss: 681.7994
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 930.0930 - val_loss: 654.9341
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 887.8082 - val_loss: 628.4307
Epoch 27/50
23/23 - 0s - 3ms/step - loss: 846.3699 - val_loss: 602.2406
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 805.7247 - val_loss: 576.1912
Epoch 29/50
23/23 - 0s - 3ms/step - loss: 765.7806 - val_loss: 551.4956
Epoch 30/50
23/23 - 0s - 3ms/step - loss: 726.8915 - val_loss: 526.9282
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 689.8313 - val_loss: 503.9615
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 654.2004 - val_loss: 480.9307
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 619.5369 - val_loss: 459.2996
Epoch 34/50
23/23 - 0s - 3ms/step - loss: 586.3145 - val_loss: 439.0499
Epoch 35/50
23/23 - 0s - 5ms/step - loss: 555.3893 - val_loss: 419.5573
Epoch 36/50
23/23 - 0s - 6ms/step - loss: 525.6959 - val_loss: 400.7320
Epoch 37/50
23/23 - 0s - 8ms/step - loss: 497.6078 - val_loss: 382.9924
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 470.7638 - val_loss: 366.3999
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 446.3142 - val_loss: 351.1128
Epoch 40/50
23/23 - 0s - 7ms/step - loss: 423.5436 - val_loss: 335.6142
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 402.0170 - val_loss: 321.1940
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 382.0555 - val_loss: 308.5302
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 364.1372 - val_loss: 295.9252
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 347.2075 - val_loss: 284.7878
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 332.3412 - val_loss: 273.5598
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 318.1866 - val_loss: 263.5441
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 305.7924 - val_loss: 254.4217
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 294.4105 - val_loss: 246.1489
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 283.8969 - val_loss: 238.2301
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 274.6290 - val_loss: 230.9861
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  258.25363903204726
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 49ms/step - loss: 1731.1375 - val_loss: 1283.6149
Epoch 2/50
23/23 - 0s - 4ms/step - loss: 1711.1523 - val_loss: 1269.1925
Epoch 3/50
23/23 - 0s - 4ms/step - loss: 1691.7719 - val_loss: 1255.4531
Epoch 4/50
23/23 - 0s - 4ms/step - loss: 1672.5388 - val_loss: 1241.7330
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1652.7224 - val_loss: 1228.5808
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1632.7954 - val_loss: 1215.2521
Epoch 7/50
23/23 - 0s - 5ms/step - loss: 1611.9795 - val_loss: 1202.1174
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1590.4270 - val_loss: 1188.9532
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1568.2781 - val_loss: 1175.5168
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1545.0977 - val_loss: 1161.6688
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1520.5470 - val_loss: 1147.9136
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1495.4554 - val_loss: 1134.1613
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1469.0652 - val_loss: 1119.8400
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1441.4907 - val_loss: 1105.7314
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1413.3280 - val_loss: 1091.0139
Epoch 16/50
23/23 - 0s - 4ms/step - loss: 1384.4812 - val_loss: 1075.8521
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1354.3881 - val_loss: 1060.9662
Epoch 18/50
23/23 - 0s - 4ms/step - loss: 1323.8960 - val_loss: 1045.3616
Epoch 19/50
23/23 - 0s - 4ms/step - loss: 1292.6793 - val_loss: 1029.6616
Epoch 20/50
23/23 - 0s - 4ms/step - loss: 1260.4841 - val_loss: 1013.9095
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1228.9150 - val_loss: 997.2502
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1196.0203 - val_loss: 980.6572
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1163.3143 - val_loss: 963.7507
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1130.2299 - val_loss: 946.7519
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1097.0173 - val_loss: 930.0924
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1064.6462 - val_loss: 912.7339
Epoch 27/50
23/23 - 0s - 3ms/step - loss: 1031.8079 - val_loss: 895.1180
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 998.7106 - val_loss: 877.9300
Epoch 29/50
23/23 - 0s - 4ms/step - loss: 966.2779 - val_loss: 860.2189
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 934.1647 - val_loss: 842.4439
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 902.1931 - val_loss: 824.2895
```

```
Epoch 32/50
23/23 - 0s - 4ms/step - loss: 870.6698 - val_loss: 806.4981
Epoch 33/50
23/23 - 0s - 4ms/step - loss: 839.5085 - val_loss: 788.7072
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 808.7048 - val_loss: 770.4736
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 778.6392 - val_loss: 752.6558
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 749.6083 - val_loss: 734.7039
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 720.8314 - val_loss: 716.9966
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 692.9999 - val_loss: 699.1638
Epoch 39/50
23/23 - 0s - 8ms/step - loss: 666.0071 - val_loss: 681.4235
Epoch 40/50
23/23 - 0s - 8ms/step - loss: 639.3978 - val_loss: 663.8911
Epoch 41/50
23/23 - 0s - 4ms/step - loss: 613.7849 - val_loss: 647.1876
Epoch 42/50
23/23 - 0s - 4ms/step - loss: 589.1309 - val_loss: 629.4208
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 565.5309 - val_loss: 612.6327
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 542.5231 - val_loss: 595.8880
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 520.6288 - val_loss: 580.4426
Epoch 46/50
23/23 - 0s - 9ms/step - loss: 499.9750 - val_loss: 564.6526
Epoch 47/50
23/23 - 0s - 7ms/step - loss: 480.2851 - val_loss: 549.6429
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 461.6893 - val_loss: 534.9199
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 444.1187 - val_loss: 520.9650
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 427.3831 - val_loss: 507.2754
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  445.54633112371994
Epoch 1/50

C:\Users\nensi\anaconda3\lib\site-packages\keras\src\layers\core\dens
e.py:87: UserWarning: Do not pass an `input_shape`/`input_dim` argumen
t to a layer. When using Sequential models, prefer using an `Input(sha
pe)` object as the first layer in the model instead.
  super().__init__(activity_regularizer=activity_regularizer, **kwarg
s)
```

```
23/23 - 1s - 64ms/step - loss: 1709.4348 - val_loss: 1244.4875
Epoch 2/50
23/23 - 0s - 5ms/step - loss: 1693.8411 - val_loss: 1232.9106
Epoch 3/50
23/23 - 0s - 5ms/step - loss: 1678.1023 - val_loss: 1221.4358
Epoch 4/50
23/23 - 0s - 8ms/step - loss: 1662.1482 - val_loss: 1209.8252
Epoch 5/50
23/23 - 0s - 4ms/step - loss: 1645.5305 - val_loss: 1198.0298
Epoch 6/50
23/23 - 0s - 4ms/step - loss: 1628.4414 - val_loss: 1185.9690
Epoch 7/50
23/23 - 0s - 4ms/step - loss: 1610.1571 - val_loss: 1173.8032
Epoch 8/50
23/23 - 0s - 4ms/step - loss: 1591.3967 - val_loss: 1160.7278
Epoch 9/50
23/23 - 0s - 4ms/step - loss: 1570.9698 - val_loss: 1147.3621
Epoch 10/50
23/23 - 0s - 4ms/step - loss: 1549.4381 - val_loss: 1133.5693
Epoch 11/50
23/23 - 0s - 4ms/step - loss: 1526.7422 - val_loss: 1119.4315
Epoch 12/50
23/23 - 0s - 4ms/step - loss: 1502.7870 - val_loss: 1104.1433
Epoch 13/50
23/23 - 0s - 4ms/step - loss: 1477.0891 - val_loss: 1088.5876
Epoch 14/50
23/23 - 0s - 4ms/step - loss: 1450.1332 - val_loss: 1072.3097
Epoch 15/50
23/23 - 0s - 4ms/step - loss: 1421.4657 - val_loss: 1055.3998
Epoch 16/50
23/23 - 0s - 6ms/step - loss: 1391.7028 - val_loss: 1037.8485
Epoch 17/50
23/23 - 0s - 4ms/step - loss: 1360.6113 - val_loss: 1019.0382
Epoch 18/50
23/23 - 0s - 5ms/step - loss: 1327.5791 - val_loss: 1000.3607
Epoch 19/50
23/23 - 0s - 5ms/step - loss: 1294.7097 - val_loss: 980.9193
Epoch 20/50
23/23 - 0s - 5ms/step - loss: 1260.3955 - val_loss: 960.9622
Epoch 21/50
23/23 - 0s - 4ms/step - loss: 1224.9500 - val_loss: 940.8091
Epoch 22/50
23/23 - 0s - 4ms/step - loss: 1189.6060 - val_loss: 920.1355
Epoch 23/50
23/23 - 0s - 4ms/step - loss: 1153.0841 - val_loss: 899.5576
Epoch 24/50
23/23 - 0s - 4ms/step - loss: 1116.3312 - val_loss: 878.4330
Epoch 25/50
23/23 - 0s - 4ms/step - loss: 1079.6982 - val_loss: 856.7847
Epoch 26/50
23/23 - 0s - 4ms/step - loss: 1043.1519 - val_loss: 834.9188
Epoch 27/50
23/23 - 0s - 4ms/step - loss: 1005.9462 - val_loss: 812.9528
Epoch 28/50
23/23 - 0s - 4ms/step - loss: 969.7411 - val_loss: 790.8743
Epoch 29/50
23/23 - 0s - 5ms/step - loss: 932.7214 - val_loss: 768.8457
Epoch 30/50
23/23 - 0s - 4ms/step - loss: 896.6287 - val_loss: 747.2631
Epoch 31/50
23/23 - 0s - 4ms/step - loss: 861.0328 - val_loss: 724.6996
```

```
Epoch 32/50
23/23 - 0s - 5ms/step - loss: 825.4691 - val_loss: 703.4494
Epoch 33/50
23/23 - 0s - 6ms/step - loss: 790.7719 - val_loss: 681.9260
Epoch 34/50
23/23 - 0s - 4ms/step - loss: 756.5089 - val_loss: 660.7355
Epoch 35/50
23/23 - 0s - 4ms/step - loss: 723.7079 - val_loss: 639.5822
Epoch 36/50
23/23 - 0s - 4ms/step - loss: 691.6521 - val_loss: 617.7855
Epoch 37/50
23/23 - 0s - 4ms/step - loss: 659.9468 - val_loss: 596.8192
Epoch 38/50
23/23 - 0s - 4ms/step - loss: 629.9774 - val_loss: 576.3166
Epoch 39/50
23/23 - 0s - 4ms/step - loss: 600.6281 - val_loss: 555.7993
Epoch 40/50
23/23 - 0s - 4ms/step - loss: 572.2749 - val_loss: 535.5280
Epoch 41/50
23/23 - 0s - 3ms/step - loss: 544.9185 - val_loss: 515.6251
Epoch 42/50
23/23 - 0s - 7ms/step - loss: 518.7054 - val_loss: 495.5542
Epoch 43/50
23/23 - 0s - 4ms/step - loss: 493.6458 - val_loss: 476.3387
Epoch 44/50
23/23 - 0s - 4ms/step - loss: 469.9028 - val_loss: 457.4878
Epoch 45/50
23/23 - 0s - 4ms/step - loss: 447.5618 - val_loss: 439.6912
Epoch 46/50
23/23 - 0s - 4ms/step - loss: 426.2695 - val_loss: 422.2115
Epoch 47/50
23/23 - 0s - 4ms/step - loss: 407.0218 - val_loss: 405.4973
Epoch 48/50
23/23 - 0s - 4ms/step - loss: 388.6431 - val_loss: 389.6381
Epoch 49/50
23/23 - 0s - 4ms/step - loss: 371.7883 - val_loss: 374.6532
Epoch 50/50
23/23 - 0s - 4ms/step - loss: 356.4360 - val_loss: 359.9413
33/33 ━━━━━━━━━━━━━━━━━━━━ 0s 2ms/step
Mean Squared Error is:  351.60584004371924
[608.1987796014439, 428.25664497461065, 324.17975691424954, 390.978841
13071575, 588.5380759511352, 454.6485791892008, 505.72034879066956, 30
7.32051053771823, 310.1279855069438, 312.47309755985947, 518.937275839
2814, 455.53012957353815, 319.1124211323441, 350.8467024101887, 315.23
62550649618, 450.74052731037455, 435.3025007809537, 315.1542254115225
3, 272.8567898169785, 253.50540255691527, 288.1337831596924, 321.44610
323128643, 326.108746138473, 382.97521237143604, 580.623434632996, 31
4.07016998178693, 433.61198900053546, 316.00449494974407, 609.84646795
08563, 319.576158283909, 286.443230406993, 581.4450798926807, 355.3803
059617851, 273.2585601135532, 265.95254119492637, 285.4524183274753, 2
25.3507834595722, 275.0225434433751, 424.50476485462025, 353.495474325
7456, 330.04006435315677, 344.89886301163693, 481.70965708217943, 299.
49258200129174, 418.3168343508188, 335.7781250833059, 431.493188595765
9, 258.25363903204726, 445.54633112371994, 351.60584004371924]
```

In [23]:
```
# mean of mse
mean_mse = np.mean(mean)
print("Mean of mean squared error: ",mean_mse)
```

```
Mean of mean squared error:  376.6700447282537
```

In [24]:
```
# Standard deviation of mse
std_mse = np.std(mean)
print("Standard deviation of mean squared error: ",std_mse)
```

```
Standard deviation of mean squared error:  100.04645926927692
```

In [ ]:
```

```