

LSTM

November 18, 2023

```
[1]: from sklearn.metrics import mean_squared_error
from torch.autograd import Variable
from sklearn.preprocessing import MinMaxScaler

import numpy as np
import pandas as pd
import pandas_datareader as pdr
import torch
import torch.nn as nn
import time
import seaborn as sns
import math, time
import plotly.express as px
import plotly.graph_objects as go
import matplotlib
import matplotlib.pyplot as plt
import gc
import plotly.io as pio

%matplotlib inline
matplotlib.rcParams['figure.facecolor'] = '#ffffff'
pio.renderers.default = "notebook_connected"
pd.options.mode.chained_assignment = None
```

0.1 Download Dataset

```
[2]: TIINGO_KEY = "c5bed0ff936833e0e5366112479003dcd8449188"

dataset_df = pdr.get_data_tingo('AAPL', start='December 12, 1980',
    ↪api_key=TIINGO_KEY)
dataset_df.to_csv('AAPL.csv')
```

C:\Users\ROG\AppData\Roaming\Python\Python310\site-packages\pandas_datareader\tingo.py:234: FutureWarning:

In a future version of pandas all arguments of concat except for the argument 'objs' will be keyword-only.

```
[3]: dataset_df = pd.read_csv('AAPL.csv')
```

```
[4]: dataset_df
```

```
[4]:
```

	symbol	date	close	high	low	open	\
0	AAPL	1980-12-12 00:00:00+00:00	28.75	28.87	28.75	28.750	
1	AAPL	1980-12-15 00:00:00+00:00	27.25	27.38	27.25	27.380	
2	AAPL	1980-12-16 00:00:00+00:00	25.25	25.37	25.25	25.370	
3	AAPL	1980-12-17 00:00:00+00:00	25.87	26.00	25.87	25.870	
4	AAPL	1980-12-18 00:00:00+00:00	26.63	26.75	26.63	26.630	
...	
10818	AAPL	2023-11-13 00:00:00+00:00	184.80	186.03	184.21	185.820	
10819	AAPL	2023-11-14 00:00:00+00:00	187.44	188.11	186.30	187.700	
10820	AAPL	2023-11-15 00:00:00+00:00	188.01	189.50	187.78	187.845	
10821	AAPL	2023-11-16 00:00:00+00:00	189.71	190.96	188.65	189.570	
10822	AAPL	2023-11-17 00:00:00+00:00	189.69	190.38	188.57	190.250	
...	
0	volume	adjClose	adjHigh	adjLow	adjOpen	adjVolume	\
0	2093900	0.099568	0.099984	0.099568	0.099568	469034069	
1	785200	0.094373	0.094823	0.094373	0.094823	175884975	
2	472000	0.087447	0.087862	0.087447	0.087862	105728105	
3	385900	0.089594	0.090044	0.089594	0.089594	86441686	
4	327900	0.092226	0.092642	0.092226	0.092226	73449673	
...	
10818	43627519	184.800000	186.030000	184.210000	185.820000	43627519	
10819	60108378	187.440000	188.110000	186.300000	187.700000	60108378	
10820	53790499	188.010000	189.500000	187.780000	187.845000	53790499	
10821	54412915	189.710000	190.960000	188.650000	189.570000	54412915	
10822	50002825	189.690000	190.380000	188.570000	190.250000	50002825	
...	
0	divCash	splitFactor					
0	0.0	1.0					
1	0.0	1.0					
2	0.0	1.0					
3	0.0	1.0					
4	0.0	1.0					
...					
10818	0.0	1.0					
10819	0.0	1.0					
10820	0.0	1.0					
10821	0.0	1.0					
10822	0.0	1.0					

```
[10823 rows x 14 columns]
```

```
[5]: dataset_df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
```

```

RangeIndex: 10823 entries, 0 to 10822
Data columns (total 14 columns):
#   Column                Non-Null Count  Dtype
---  -
0   symbol                 10823 non-null  object
1   date                   10823 non-null  object
2   close                  10823 non-null  float64
3   high                   10823 non-null  float64
4   low                    10823 non-null  float64
5   open                   10823 non-null  float64
6   volume                 10823 non-null  int64
7   adjClose               10823 non-null  float64
8   adjHigh                10823 non-null  float64
9   adjLow                 10823 non-null  float64
10  adjOpen                10823 non-null  float64
11  adjVolume              10823 non-null  int64
12  divCash                10823 non-null  float64
13  splitFactor            10823 non-null  float64
dtypes: float64(10), int64(2), object(2)
memory usage: 1.2+ MB

```

0.2 Cleaning Dataset

```

[6]: #removing the timestamp
dataset_df['date'] = dataset_df['date'].str.split(' ').str[0]

dataset_df.head()

```

```

[6]:   symbol      date  close  high  low  open  volume  adjClose  adjHigh \
0   AAPL  1980-12-12  28.75  28.87  28.75  28.75  2093900  0.099568  0.099984
1   AAPL  1980-12-15  27.25  27.38  27.25  27.38   785200  0.094373  0.094823
2   AAPL  1980-12-16  25.25  25.37  25.25  25.37   472000  0.087447  0.087862
3   AAPL  1980-12-17  25.87  26.00  25.87  25.87   385900  0.089594  0.090044
4   AAPL  1980-12-18  26.63  26.75  26.63  26.63   327900  0.092226  0.092642

      adjLow  adjOpen  adjVolume  divCash  splitFactor
0  0.099568  0.099568  469034069      0.0          1.0
1  0.094373  0.094823  175884975      0.0          1.0
2  0.087447  0.087862  105728105      0.0          1.0
3  0.089594  0.089594   86441686      0.0          1.0
4  0.092226  0.092226   73449673      0.0          1.0

```

```

[7]: #resetting index and changing variable type
dataset_df = dataset_df.reset_index()[['date', 'adjClose']]
df_dates = dataset_df.iloc[:,0]
dataset_df['date'] = pd.to_datetime(dataset_df['date'])
dataset_df = dataset_df.set_index('date')

```

```
dataset_df.head()
```

```
[7]:      adjClose  
date  
1980-12-12  0.099568  
1980-12-15  0.094373  
1980-12-16  0.087447  
1980-12-17  0.089594  
1980-12-18  0.092226
```

```
[8]: sns.set_style("darkgrid")  
plt.figure(figsize = (15, 9))  
plt.plot(dataset_df[['adjClose']])  
plt.title("Apple Stock Price", fontsize=18, fontweight='bold')  
plt.xlabel('Date', fontsize=18)  
plt.ylabel('Close Price (in $)', fontsize=18)  
plt.show()
```



```
[9]: #array of original prices data  
dataset_df_prices = dataset_df['adjClose'].values.reshape(-1,1)  
  
print(dataset_df_prices)
```

```
[[9.95681294e-02]  
 [9.43732705e-02]
```

```
[8.74467919e-02]
...
[1.88010000e+02]
[1.89710000e+02]
[1.89690000e+02]]
```

```
[10]: def get_default_device():
        if torch.cuda.is_available():
            return torch.device('cuda')
        else:
            return torch.device('cpu')

    def to_device(data, device):
        if isinstance(data, (list,tuple)):
            return [to_device(x, device) for x in data]
        return data.to(device, non_blocking=True)

    def torch_data(data, device):
        return to_device(torch.from_numpy(data).type(torch.Tensor), device)

    device = get_default_device()
    device
```

```
[10]: device(type='cpu')
```

0.3 Preprocessing Dataset

```
[11]: def create_sequence(dataset, time_step):
        dataX, dataY = [], []
        for i in range(len(dataset) - time_step -1):
            a = dataset.iloc[i:(i + time_step)]
            dataX.append(a)
            dataY.append(dataset.iloc[i + time_step])
        return np.array(dataX), np.array(dataY)
```

```
[12]: def curate_dataset(dataset, time_step):
        train_size = round(len(dataset) * 0.80)
        remaining_size = len(dataset) - train_size
        val_size = round(0.50 * remaining_size)
        train_data, val_data, test_data = dataset.iloc[0:train_size, :], dataset.
        ↪iloc[train_size:(train_size + val_size), :], dataset.iloc[(train_size +
        ↪val_size):len(dataset), :]

        scaler = MinMaxScaler(feature_range = (0, 1))
        train_data['adjClose'] = scaler.fit_transform(np.
        ↪array(train_data['adjClose']).reshape(-1, 1))
```

```

    val_data['adjClose'] = scaler.transform(np.array(val_data['adjClose'])).
↳reshape(-1, 1))
    test_data['adjClose'] = scaler.transform(np.array(test_data['adjClose'])).
↳reshape(-1, 1))

    X_train, y_train = create_sequence(train_data, time_step)
    X_val, y_val = create_sequence(val_data, time_step)
    X_test, y_test = create_sequence(test_data, time_step)

    X_train = X_train.reshape(X_train.shape[0], X_train.shape[1], 1)
    X_val = X_val.reshape(X_val.shape[0], X_val.shape[1], 1)
    X_test = X_test.reshape(X_test.shape[0], X_test.shape[1], 1)

    y_train = y_train.reshape(y_train.shape[0], 1)
    y_val = y_val.reshape(y_val.shape[0], 1)
    y_test = y_test.reshape(y_test.shape[0], 1)

    return X_train, X_val, X_test, y_train, y_val, y_test, scaler

```

```

[13]: def curate_dataset_test(dataset, time_step):
    train_size = round(len(dataset) * 0.90)
    train_data, test_data = dataset.iloc[0:train_size, :], dataset.
↳iloc[train_size:, :]

    scaler = MinMaxScaler(feature_range = (0, 1))
    train_data['adjClose'] = scaler.fit_transform(np.
↳array(train_data['adjClose']).reshape(-1, 1))
    test_data['adjClose'] = scaler.transform(np.array(test_data['adjClose'])).
↳reshape(-1, 1))

    X_train, y_train = create_sequence(train_data, time_step)
    X_test, y_test = create_sequence(test_data, time_step)

    X_train = X_train.reshape(X_train.shape[0], X_train.shape[1], 1)
    X_test = X_test.reshape(X_test.shape[0], X_test.shape[1], 1)

    y_train = y_train.reshape(y_train.shape[0], 1)
    y_test = y_test.reshape(y_test.shape[0], 1)

    return X_train, X_test, y_train, y_test, scaler

```

0.4 Model Architecture (Vanilla RNN)

```

[14]: class RNN_base(nn.Module):
    def __init__(self, input_dim, hidden_dim, layer_dim, output_dim):
        super(RNN_base, self).__init__()

```

```

        self.hidden_dim = hidden_dim

        self.layer_dim = layer_dim

        self.rnn = nn.RNN(input_dim, hidden_dim, layer_dim, batch_first = True,
↪nonlinearity = 'tanh')

        self.fc = nn.Linear(hidden_dim, output_dim)

    def forward(self, x):

        h0 = Variable(torch.zeros(self.layer_dim, x.size(0), self.hidden_dim,
↪device=device))

        out, hn = self.rnn(x, h0)
        out = self.fc(out[:, -1, :])
        return out

```

```

[15]: def fit(num_epochs, lr, model, loss_type, opt_func, X_train, y_train):
    optimiser = opt_func(model.parameters(), lr)
    hist = np.zeros(num_epochs)
    start_time = time.time()
    for t in range(num_epochs):
        y_train_pred = model(X_train)
        loss = loss_type(y_train_pred, y_train)
        print("Epoch ", t, "MSE: ", loss.item())
        hist[t] = loss.item()

        optimiser.zero_grad()

        loss.backward()

        optimiser.step()

    training_time = time.time()-start_time
    print("T-time: {} \n".format(training_time))

    return hist, y_train_pred

```

```

[16]: def plot_loss(history):
    sns.set_style("darkgrid")
    fig = plt.figure(figsize=(8, 5))
    fig.subplots_adjust(hspace=0.2, wspace=0.2)
    ax = sns.lineplot(data = history, color='royalblue')
    ax.set_xlabel("Epoch", size = 14)
    ax.set_ylabel("Loss", size = 14)
    ax.set_title("Training Loss", size = 14, fontweight='bold')

```

```
[17]: def plotly_predictions(results):
fig = go.Figure()
fig.add_trace(go.Scatter(x=results['date'], y=results[0],
                        mode='lines',
                        name='Train prediction',
                        line = dict(color='#ff7f0e'))))
fig.add_trace(go.Scatter(x=results['date'], y=results[1],
                        mode='lines',
                        name='Test prediction',
                        line = dict(color='#d62728'))))
fig.add_trace(go.Scatter(x=results['date'], y=results[2],
                        opacity=0.6,
                        mode='lines',
                        name='Actual Value',
                        line = dict(color='#1f77b4'))))

fig.update_layout(
    xaxis=dict(
        title_text='Dates',
        titlefont=dict(
            family='Rockwell',
            size=12,
            color='black',
        ),
        showline=True,
        showgrid=True,
        showticklabels=True,
        linecolor='black',
        linewidth=2,
        ticks='outside',
        tickfont=dict(
            family='Rockwell',
            size=12,
            color='black',
        ),
    ),
    yaxis=dict(
        title_text='Close (USD)',
        titlefont=dict(
            family='Rockwell',
            size=12,
            color='black',
        ),
        showline=True,
        showgrid=True,
        showticklabels=True,
        linecolor='black',
        linewidth=2,
    ),
)
```



```

        ticks='outside',
        tickfont=dict(
            family='Rockwell',
            size=12,
            color='black',
        ),
    ),
    showlegend=True,
    template = 'plotly_white'

)

annotations = []
annotations.append(dict(xref='paper', yref='paper', x=0.0, y=1.05,
                        xanchor='left', yanchor='bottom',
                        text='Results',
                        font=dict(family='Rockwell',
                                size=26,
                                color='black'),
                        showarrow=False))

fig.update_layout(annotations=annotations)

fig.show()

```

```

[18]: def evaluate_model_experiments(model, num_epochs, lr, loss_type, optimiser,
    ↪time_step):
    X_train, X_val, X_test, y_train, y_val, y_test, scaler =
    ↪curate_dataset(dataset_df, time_step)
    X_train = torch_data(X_train, device)
    X_val = torch_data(X_val, device)
    X_test = torch_data(X_test, device)
    y_train = torch_data(y_train, device)
    y_val = torch_data(y_val, device)
    y_test = torch_data(y_test, device)

    history, y_train_pred = fit(num_epochs, lr, model, loss_type, optimiser,
    ↪X_train, y_train)

    gc.collect()
    torch.cuda.empty_cache()

    y_val_pred = model(X_val)

    y_train_pred = scaler.inverse_transform(y_train_pred.cpu().detach().numpy())
    y_train = scaler.inverse_transform(y_train.cpu().detach().numpy())
    y_val_pred = scaler.inverse_transform(y_val_pred.cpu().detach().numpy())
    y_val = scaler.inverse_transform(y_val.cpu().detach().numpy())

```

```

trainScore = math.sqrt(mean_squared_error(y_train, y_train_pred))
print("=====")
print('Train Score: %.2f RMSE' % (trainScore))
print("=====")
valScore = math.sqrt(mean_squared_error(y_val, y_val_pred))
print('Validation Score: %.2f RMSE' % (valScore))
print("=====")

end_of_time = len(y_train_pred) + len(y_val_pred) + (time_step * 2) + 1

trainPredictPlot = np.empty_like(dataset_df_prices[0 : end_of_time])
trainPredictPlot[:, :] = np.nan
trainPredictPlot[time_step : len(y_train_pred) + time_step, :] =
↪y_train_pred

valPredictPlot = np.empty_like(dataset_df_prices[0 : end_of_time])
valPredictPlot[:, :] = np.nan
valPredictPlot[len(y_train_pred) + (time_step * 2) + 1 : end_of_time, :] =
↪y_val_pred

original = dataset_df[0 : end_of_time]
predictions = np.append(trainPredictPlot, valPredictPlot, axis=1)
predictions = np.append(predictions, original, axis=1)
result = pd.DataFrame(predictions)
result = pd.concat([result, df_dates.iloc[0 : end_of_time]], axis = 1)

metadata = [[time_step, model.layer_dim, model.hidden_dim, trainScore,
↪valScore]]
metadata = pd.DataFrame(metadata, columns=['time_step', 'num_layers',
↪'hidden_dim', 'trainScore', 'valScore'])

return metadata

```

```

[19]: def evaluate_single_model(model, num_epochs, lr, loss_type, optimiser,
↪time_step):
    X_train, X_val, X_test, y_train, y_val, y_test, scaler =
↪curate_dataset(dataset_df, time_step)
    X_train = torch_data(X_train, device)
    X_val = torch_data(X_val, device)
    X_test = torch_data(X_test, device)
    y_train = torch_data(y_train, device)
    y_val = torch_data(y_val, device)
    y_test = torch_data(y_test, device)

    history, y_train_pred = fit(num_epochs, lr, model, loss_type, optimiser,
↪X_train, y_train)

```

```

gc.collect()
torch.cuda.empty_cache()

y_val_pred = model(X_val)

y_train_pred = scaler.inverse_transform(y_train_pred.cpu().detach().numpy())
y_train = scaler.inverse_transform(y_train.cpu().detach().numpy())
y_val_pred = scaler.inverse_transform(y_val_pred.cpu().detach().numpy())
y_val = scaler.inverse_transform(y_val.cpu().detach().numpy())

trainScore = math.sqrt(mean_squared_error(y_train, y_train_pred))
print("=====")
print('Train Score: %.2f RMSE' % (trainScore))
print("=====")
valScore = math.sqrt(mean_squared_error(y_val, y_val_pred))
print('Validation Score: %.2f RMSE' % (valScore))
print("=====")

end_of_time = len(y_train_pred) + len(y_val_pred) + (time_step * 2) + 1

trainPredictPlot = np.empty_like(dataset_df_prices[0 : end_of_time])
trainPredictPlot[:, :] = np.nan
trainPredictPlot[time_step : len(y_train_pred) + time_step, :] = 
↪y_train_pred

valPredictPlot = np.empty_like(dataset_df_prices[0 : end_of_time])
valPredictPlot[:, :] = np.nan
valPredictPlot[len(y_train_pred) + (time_step * 2) + 1 : end_of_time, :] = 
↪y_val_pred

original = dataset_df[0 : end_of_time]
predictions = np.append(trainPredictPlot, valPredictPlot, axis=1)
predictions = np.append(predictions, original, axis=1)
result = pd.DataFrame(predictions)
result = pd.concat([result, df_dates.iloc[0 : end_of_time]], axis = 1)
plot_loss(history)
plotly_predictions(result)
return None

```

```

[20]: def test_final_model(model, num_epochs, lr, loss_type, optimiser, time_step):
    X_train, X_test, y_train, y_test, scaler = curate_dataset_test(dataset_df, 
↪time_step)
    X_train = torch_data(X_train, device)
    X_test = torch_data(X_test, device)
    y_train = torch_data(y_train, device)
    y_test = torch_data(y_test, device)

```

```

    history, y_train_pred = fit(num_epochs, lr, model, loss_type, optimiser,
↪X_train, y_train)

    gc.collect()
    torch.cuda.empty_cache()

    y_test_pred = model(X_test)

    y_train_pred = scaler.inverse_transform(y_train_pred.cpu().detach().numpy())
    y_train = scaler.inverse_transform(y_train.cpu().detach().numpy())
    y_test_pred = scaler.inverse_transform(y_test_pred.cpu().detach().numpy())
    y_test = scaler.inverse_transform(y_test.cpu().detach().numpy())

    trainScore = math.sqrt(mean_squared_error(y_train, y_train_pred))
    print("=====")
    print('Train Score: %.2f RMSE' % (trainScore))
    print("=====")
    testScore = math.sqrt(mean_squared_error(y_test, y_test_pred))
    print('Test Score: %.2f RMSE' % (testScore))
    print("=====")

    end_of_time = len(y_train_pred) + len(y_test_pred) + (time_step * 2) + 1

    trainPredictPlot = np.empty_like(dataset_df_prices[0 : end_of_time])
    trainPredictPlot[:, :] = np.nan
    trainPredictPlot[time_step : len(y_train_pred) + time_step, :] =
↪y_train_pred

    testPredictPlot = np.empty_like(dataset_df_prices[0 : end_of_time])
    testPredictPlot[:, :] = np.nan
    testPredictPlot[len(y_train_pred) + (time_step * 2) + 1 : end_of_time, :]
↪= y_test_pred

    original = dataset_df[0 : end_of_time]
    predictions = np.append(trainPredictPlot, testPredictPlot, axis=1)
    predictions = np.append(predictions, original, axis=1)
    result = pd.DataFrame(predictions)
    result = pd.concat([result, df_dates.iloc[0 : end_of_time]], axis = 1)
    plot_loss(history)
    plotly_predictions(result)
    return None

```

0.5 Vanilla RNN

```
[21]: input_dim = 1
hidden_dim = 1
num_layers = 1
output_dim = 1
num_epochs = 100
lr = 0.01
loss_type = torch.nn.MSELoss(reduction='mean')
optimiser = torch.optim.Adam
time_step = 20

torch.manual_seed(42)
vanilla_rnn = RNN_base(input_dim = input_dim, hidden_dim = hidden_dim,
    ↪output_dim = output_dim, layer_dim = num_layers)
vanilla_rnn = to_device(vanilla_rnn, device)
```

0.6 Model Architecture (Vanilla RNN with ReLU)

```
[22]: class RNN_relu(nn.Module):
    def __init__(self, input_dim, hidden_dim, layer_dim, output_dim):
        super(RNN_relu, self).__init__()

        self.hidden_dim = hidden_dim

        self.layer_dim = layer_dim

        self.rnn = nn.RNN(input_dim, hidden_dim, layer_dim, batch_first = True,
    ↪nonlinearity = 'relu')

        self.fc = nn.Linear(hidden_dim, output_dim)

    def forward(self, x):

        h0 = Variable(torch.zeros(self.layer_dim, x.size(0), self.hidden_dim,
    ↪device=device))

        out, hn = self.rnn(x, h0)
        out = self.fc(out[:, -1, :])
        return out
```

0.7 Vanilla RNN with ReLU

```
[23]: input_dim = 1
hidden_dim = 1
num_layers = 1
output_dim = 1
```

```

num_epochs = 100
lr = 0.01
loss_type = torch.nn.MSELoss(reduction='mean')
optimiser = torch.optim.Adam
time_step = 20

torch.manual_seed(42)
relu_rnn = RNN_relu(input_dim = input_dim, hidden_dim = hidden_dim, output_dim=
    ↪ output_dim, layer_dim = num_layers)
relu_rnn = to_device(relu_rnn, device)

evaluate_single_model(relu_rnn, num_epochs, lr, loss_type, optimiser, time_step)

```

```

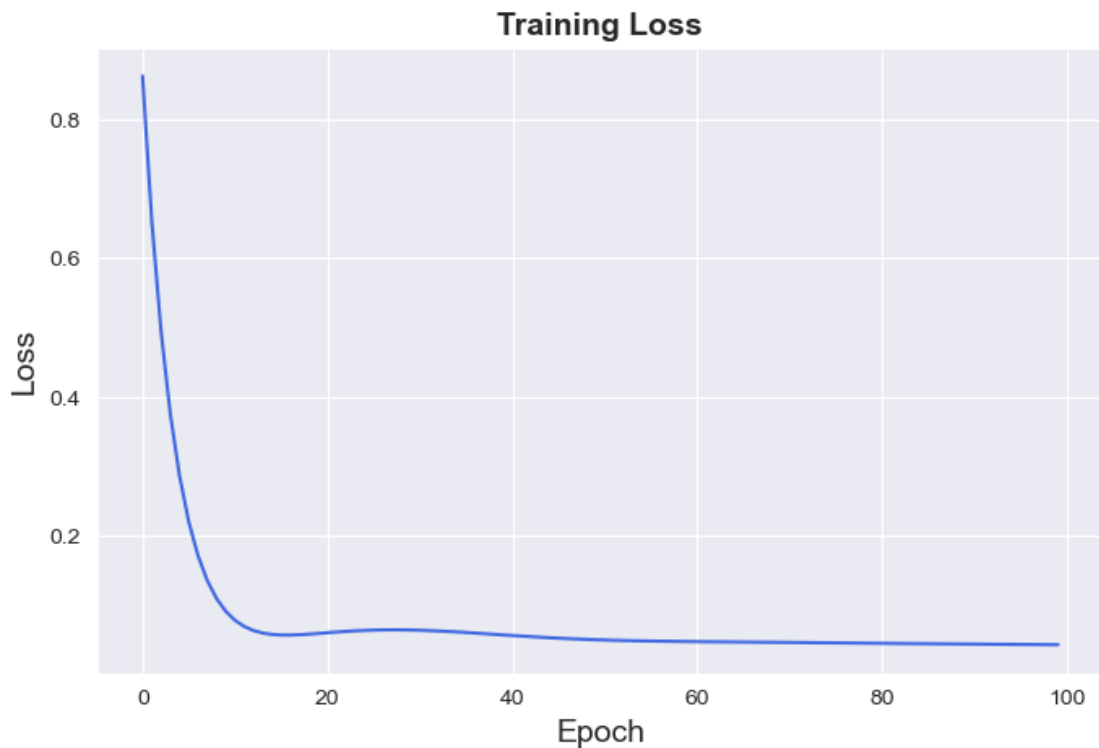
Epoch 0 MSE: 0.8626009821891785
Epoch 1 MSE: 0.6538116931915283
Epoch 2 MSE: 0.4951014816761017
Epoch 3 MSE: 0.3755500018596649
Epoch 4 MSE: 0.2861906588077545
Epoch 5 MSE: 0.21986396610736847
Epoch 6 MSE: 0.17097650468349457
Epoch 7 MSE: 0.13522690534591675
Epoch 8 MSE: 0.1093410849571228
Epoch 9 MSE: 0.09084150195121765
Epoch 10 MSE: 0.07785815000534058
Epoch 11 MSE: 0.06897977739572525
Epoch 12 MSE: 0.0631399005651474
Epoch 13 MSE: 0.05953085795044899
Epoch 14 MSE: 0.057539667934179306
Epoch 15 MSE: 0.056700270622968674
Epoch 16 MSE: 0.05665802210569382
Epoch 17 MSE: 0.05714334174990654
Epoch 18 MSE: 0.057951975613832474
Epoch 19 MSE: 0.05893015116453171
Epoch 20 MSE: 0.05996333435177803
Epoch 21 MSE: 0.06096770614385605
Epoch 22 MSE: 0.06188347190618515
Epoch 23 MSE: 0.06266980618238449
Epoch 24 MSE: 0.06330068409442902
Epoch 25 MSE: 0.06376182287931442
Epoch 26 MSE: 0.06404796987771988
Epoch 27 MSE: 0.06416090577840805
Epoch 28 MSE: 0.0641077533364296
Epoch 29 MSE: 0.06389957666397095
Epoch 30 MSE: 0.06355028599500656
Epoch 31 MSE: 0.06307563930749893
Epoch 32 MSE: 0.06249261647462845
Epoch 33 MSE: 0.06181862950325012
Epoch 34 MSE: 0.061071161180734634

```

Epoch	35	MSE:	0.060267239809036255
Epoch	36	MSE:	0.059423189610242844
Epoch	37	MSE:	0.05855433642864227
Epoch	38	MSE:	0.057674769312143326
Epoch	39	MSE:	0.056797269731760025
Epoch	40	MSE:	0.0559331439435482
Epoch	41	MSE:	0.0550922155380249
Epoch	42	MSE:	0.054282769560813904
Epoch	43	MSE:	0.05351156368851662
Epoch	44	MSE:	0.052783891558647156
Epoch	45	MSE:	0.05210358649492264
Epoch	46	MSE:	0.05147317051887512
Epoch	47	MSE:	0.050893913954496384
Epoch	48	MSE:	0.05036596208810806
Epoch	49	MSE:	0.04988844320178032
Epoch	50	MSE:	0.04945962876081467
Epoch	51	MSE:	0.04907705634832382
Epoch	52	MSE:	0.04873766377568245
Epoch	53	MSE:	0.04843795672059059
Epoch	54	MSE:	0.04817410930991173
Epoch	55	MSE:	0.047942087054252625
Epoch	56	MSE:	0.047737814486026764
Epoch	57	MSE:	0.04755723476409912
Epoch	58	MSE:	0.04739641770720482
Epoch	59	MSE:	0.047251634299755096
Epoch	60	MSE:	0.04711943492293358
Epoch	61	MSE:	0.04699669033288956
Epoch	62	MSE:	0.04688062518835068
Epoch	63	MSE:	0.04676882550120354
Epoch	64	MSE:	0.046659283339977264
Epoch	65	MSE:	0.046550359576940536
Epoch	66	MSE:	0.04644076153635979
Epoch	67	MSE:	0.0463295616209507
Epoch	68	MSE:	0.046216126531362534
Epoch	69	MSE:	0.04610009491443634
Epoch	70	MSE:	0.04598134011030197
Epoch	71	MSE:	0.045859940350055695
Epoch	72	MSE:	0.0457361377756691
Epoch	73	MSE:	0.04561026766896248
Epoch	74	MSE:	0.04548276960849762
Epoch	75	MSE:	0.045354120433330536
Epoch	76	MSE:	0.045224837958812714
Epoch	77	MSE:	0.04509541392326355
Epoch	78	MSE:	0.044966332614421844
Epoch	79	MSE:	0.044838037341833115
Epoch	80	MSE:	0.0447109192609787
Epoch	81	MSE:	0.04458531364798546
Epoch	82	MSE:	0.04446149617433548

Epoch 83 MSE: 0.04433968663215637
Epoch 84 MSE: 0.04422002285718918
Epoch 85 MSE: 0.044102609157562256
Epoch 86 MSE: 0.04398748651146889
Epoch 87 MSE: 0.043874647468328476
Epoch 88 MSE: 0.04376406595110893
Epoch 89 MSE: 0.04365566000342369
Epoch 90 MSE: 0.043549321591854095
Epoch 91 MSE: 0.04344496130943298
Epoch 92 MSE: 0.04334244132041931
Epoch 93 MSE: 0.04324163869023323
Epoch 94 MSE: 0.04314242675900459
Epoch 95 MSE: 0.04304467514157295
Epoch 96 MSE: 0.04294827952980995
Epoch 97 MSE: 0.042853135615587234
Epoch 98 MSE: 0.042759139090776443
Epoch 99 MSE: 0.04266621917486191
T-time: 0.8902041912078857

=====
Train Score: 6.16 RMSE
=====
Validation Score: 35.55 RMSE
=====



0.8 Hyperparameters Tuning

```
[24]: input_dim = 1
output_dim = 1
num_epochs = 100
lr = 0.01
loss_type = torch.nn.MSELoss(reduction = 'mean')
optimiser = torch.optim.Adam

num_layers = [1, 2]
sliding_windows = [20, 30, 50, 100]
hidden_dims = [2, 4, 8, 16, 32]

tanh_results = []
relu_results = []
for time_step in sliding_windows:
    for hidden_dim in hidden_dims:
        for layers in num_layers:

            print("=====")
            print("Time Step =", time_step, "| Hidden States =", hidden_dim, "| Num Layers =", layers)
            print("=====")
            print()

            torch.manual_seed(42)
            tanh_rnn = RNN_base(input_dim = input_dim, hidden_dim = hidden_dim,
                                output_dim = output_dim, layer_dim = layers)
            tanh_rnn = to_device(tanh_rnn, device)

            tanh_res = evaluate_model_experiments(tanh_rnn, num_epochs, lr,
                                                  loss_type, optimiser, time_step)
            tanh_results += [tanh_res.iloc[0]]
            print()

            torch.manual_seed(42)
            relu_rnn_exp = RNN_relu(input_dim = input_dim, hidden_dim =
                                     hidden_dim, output_dim = output_dim, layer_dim = layers)
            relu_rnn_exp = to_device(relu_rnn_exp, device)
            relu_res = evaluate_model_experiments(relu_rnn_exp, num_epochs, lr,
                                                  loss_type, optimiser, time_step)
            relu_results += [relu_res.iloc[0]]
            print()
```

```
=====
Time Step = 20 | Hidden States = 2 | Num Layers = 1
```

=====

Epoch 0 MSE: 0.3117377460002899
Epoch 1 MSE: 0.2746148705482483
Epoch 2 MSE: 0.24029582738876343
Epoch 3 MSE: 0.2088046669960022
Epoch 4 MSE: 0.18011356890201569
Epoch 5 MSE: 0.15414702892303467
Epoch 6 MSE: 0.13079072535037994
Epoch 7 MSE: 0.10990475863218307
Epoch 8 MSE: 0.09133993089199066
Epoch 9 MSE: 0.07495430111885071
Epoch 10 MSE: 0.06062619760632515
Epoch 11 MSE: 0.0482601523399353
Epoch 12 MSE: 0.03778504580259323
Epoch 13 MSE: 0.029145292937755585
Epoch 14 MSE: 0.022287432104349136
Epoch 15 MSE: 0.017145032063126564
Epoch 16 MSE: 0.013624034821987152
Epoch 17 MSE: 0.011590245179831982
Epoch 18 MSE: 0.010860525071620941
Epoch 19 MSE: 0.011199633590877056
Epoch 20 MSE: 0.012325135990977287
Epoch 21 MSE: 0.013922504149377346
Epoch 22 MSE: 0.01567043736577034
Epoch 23 MSE: 0.017272917553782463
Epoch 24 MSE: 0.018491139635443687
Epoch 25 MSE: 0.019167141988873482
Epoch 26 MSE: 0.019233496859669685
Epoch 27 MSE: 0.018707819283008575
Epoch 28 MSE: 0.017675455659627914
Epoch 29 MSE: 0.016265716403722763
Epoch 30 MSE: 0.014627196826040745
Epoch 31 MSE: 0.012906101532280445
Epoch 32 MSE: 0.0112299844622612
Epoch 33 MSE: 0.00969753973186016
Epoch 34 MSE: 0.008374340832233429
Epoch 35 MSE: 0.007293331902474165
Epoch 36 MSE: 0.006458870600908995
Epoch 37 MSE: 0.005852764938026667
Epoch 38 MSE: 0.005441170185804367
Epoch 39 MSE: 0.0051812585443258286
Epoch 40 MSE: 0.005027052015066147
Epoch 41 MSE: 0.004934088326990604
Epoch 42 MSE: 0.004862802103161812
Epoch 43 MSE: 0.004780729301273823
Epoch 44 MSE: 0.0046636853367090225
Epoch 45 MSE: 0.004496104083955288

Epoch	46	MSE:	0.004270744509994984
Epoch	47	MSE:	0.003987906035035849
Epoch	48	MSE:	0.00365428626537323
Epoch	49	MSE:	0.0032815926242619753
Epoch	50	MSE:	0.0028849891386926174
Epoch	51	MSE:	0.0024814587086439133
Epoch	52	MSE:	0.002088163746520877
Epoch	53	MSE:	0.0017209150828421116
Epoch	54	MSE:	0.0013928103726357222
Epoch	55	MSE:	0.001113177859224379
Epoch	56	MSE:	0.0008869089651852846
Epoch	57	MSE:	0.0007142574759200215
Epoch	58	MSE:	0.0005911331390962005
Epoch	59	MSE:	0.0005098793189972639
Epoch	60	MSE:	0.00046043048496358097
Epoch	61	MSE:	0.00043171283323317766
Epoch	62	MSE:	0.00041307733044959605
Epoch	63	MSE:	0.0003955672145821154
Epoch	64	MSE:	0.0003728352312464267
Epoch	65	MSE:	0.00034157687332481146
Epoch	66	MSE:	0.00030148058431223035
Epoch	67	MSE:	0.0002547134936321527
Epoch	68	MSE:	0.00020510681497398764
Epoch	69	MSE:	0.00015719386283308268
Epoch	70	MSE:	0.00011528654431458563
Epoch	71	MSE:	8.273294224636629e-05
Epoch	72	MSE:	6.144928920548409e-05
Epoch	73	MSE:	5.1759907364612445e-05
Epoch	74	MSE:	5.251675975159742e-05
Epoch	75	MSE:	6.143575592432171e-05
Epoch	76	MSE:	7.555991760455072e-05
Epoch	77	MSE:	9.175587183563039e-05
Epoch	78	MSE:	0.00010716305405367166
Epoch	79	MSE:	0.00011953746434301138
Epoch	80	MSE:	0.0001274529640795663
Epoch	81	MSE:	0.00013035847223363817
Epoch	82	MSE:	0.0001285011530853808
Epoch	83	MSE:	0.0001227488974109292
Epoch	84	MSE:	0.00011435322812758386
Epoch	85	MSE:	0.00010469750850461423
Epoch	86	MSE:	9.506429341854528e-05
Epoch	87	MSE:	8.646068454254419e-05
Epoch	88	MSE:	7.951490260893479e-05
Epoch	89	MSE:	7.444860966643319e-05
Epoch	90	MSE:	7.112261664588004e-05
Epoch	91	MSE:	6.913165270816535e-05
Epoch	92	MSE:	6.792864587623626e-05
Epoch	93	MSE:	6.695143383694813e-05

Epoch 94 MSE: 6.572956044692546e-05
Epoch 95 MSE: 6.395686068572104e-05
Epoch 96 MSE: 6.15210083196871e-05
Epoch 97 MSE: 5.8493082178756595e-05
Epoch 98 MSE: 5.5085391068132594e-05
Epoch 99 MSE: 5.159010834177025e-05
T-time: 1.8453047275543213

=====
Train Score: 0.21 RMSE
=====
Validation Score: 7.19 RMSE
=====

Epoch 0 MSE: 0.3827359974384308
Epoch 1 MSE: 0.3520311713218689
Epoch 2 MSE: 0.32390904426574707
Epoch 3 MSE: 0.2981649339199066
Epoch 4 MSE: 0.27455583214759827
Epoch 5 MSE: 0.25288188457489014
Epoch 6 MSE: 0.23295852541923523
Epoch 7 MSE: 0.21464243531227112
Epoch 8 MSE: 0.1978011131286621
Epoch 9 MSE: 0.18231302499771118
Epoch 10 MSE: 0.16807158291339874
Epoch 11 MSE: 0.1549799144268036
Epoch 12 MSE: 0.14294840395450592
Epoch 13 MSE: 0.13189317286014557
Epoch 14 MSE: 0.12173602730035782
Epoch 15 MSE: 0.11251281201839447
Epoch 16 MSE: 0.10683837532997131
Epoch 17 MSE: 0.10185562819242477
Epoch 18 MSE: 0.0972844660282135
Epoch 19 MSE: 0.09301668405532837
Epoch 20 MSE: 0.08900274336338043
Epoch 21 MSE: 0.08521147072315216
Epoch 22 MSE: 0.08161132037639618
Epoch 23 MSE: 0.07817497104406357
Epoch 24 MSE: 0.074886754155159
Epoch 25 MSE: 0.07173069566488266
Epoch 26 MSE: 0.06869389116764069
Epoch 27 MSE: 0.06576559692621231
Epoch 28 MSE: 0.06293129175901413
Epoch 29 MSE: 0.06017298251390457
Epoch 30 MSE: 0.05747758224606514
Epoch 31 MSE: 0.05482881888747215
Epoch 32 MSE: 0.052210211753845215
Epoch 33 MSE: 0.04961252957582474

Epoch	34	MSE:	0.047029681503772736
Epoch	35	MSE:	0.044454678893089294
Epoch	36	MSE:	0.041884973645210266
Epoch	37	MSE:	0.0393255241215229
Epoch	38	MSE:	0.03678921237587929
Epoch	39	MSE:	0.034300755709409714
Epoch	40	MSE:	0.03191641718149185
Epoch	41	MSE:	0.02969357557594776
Epoch	42	MSE:	0.028323451057076454
Epoch	43	MSE:	0.027018167078495026
Epoch	44	MSE:	0.025080803781747818
Epoch	45	MSE:	0.02265768125653267
Epoch	46	MSE:	0.020739207044243813
Epoch	47	MSE:	0.019182784482836723
Epoch	48	MSE:	0.017726972699165344
Epoch	49	MSE:	0.016350198537111282
Epoch	50	MSE:	0.015056292526423931
Epoch	51	MSE:	0.01385438907891512
Epoch	52	MSE:	0.012753626331686974
Epoch	53	MSE:	0.01176621112972498
Epoch	54	MSE:	0.01089926902204752
Epoch	55	MSE:	0.010146772488951683
Epoch	56	MSE:	0.009485400281846523
Epoch	57	MSE:	0.008878180757164955
Epoch	58	MSE:	0.008289242163300514
Epoch	59	MSE:	0.007702012080699205
Epoch	60	MSE:	0.007124858442693949
Epoch	61	MSE:	0.006580339279025793
Epoch	62	MSE:	0.006089876871556044
Epoch	63	MSE:	0.005661685485392809
Epoch	64	MSE:	0.0052896165288984776
Epoch	65	MSE:	0.004957614466547966
Epoch	66	MSE:	0.004647092893719673
Epoch	67	MSE:	0.004343724809587002
Epoch	68	MSE:	0.004041047766804695
Epoch	69	MSE:	0.0037405428010970354
Epoch	70	MSE:	0.003448688890784979
Epoch	71	MSE:	0.00317455199547112
Epoch	72	MSE:	0.002923700027167797
Epoch	73	MSE:	0.0026991108898073435
Epoch	74	MSE:	0.0024961994495242834
Epoch	75	MSE:	0.002305493922904134
Epoch	76	MSE:	0.0021182100754231215
Epoch	77	MSE:	0.0019312226213514805
Epoch	78	MSE:	0.0017489787423983216
Epoch	79	MSE:	0.0015777562512084842
Epoch	80	MSE:	0.0014215982519090176
Epoch	81	MSE:	0.001281876233406365

Epoch 82 MSE: 0.0011569602647796273
Epoch 83 MSE: 0.0010438221506774426
Epoch 84 MSE: 0.0009400132694281638
Epoch 85 MSE: 0.0008441716199740767
Epoch 86 MSE: 0.0007566206040792167
Epoch 87 MSE: 0.000679206452332437
Epoch 88 MSE: 0.0006130092078819871
Epoch 89 MSE: 0.0005631667445413768
Epoch 90 MSE: 0.0005560519639402628
Epoch 91 MSE: 0.0005452704499475658
Epoch 92 MSE: 0.0005018326919525862
Epoch 93 MSE: 0.0004423184727784246
Epoch 94 MSE: 0.0003954576386604458
Epoch 95 MSE: 0.0003737170191016048
Epoch 96 MSE: 0.00035890069557353854
Epoch 97 MSE: 0.0003344895667396486
Epoch 98 MSE: 0.0003006292972713709
Epoch 99 MSE: 0.0002652383700478822
T-time: 1.5774409770965576

=====
Train Score: 0.49 RMSE
=====
Validation Score: 1.16 RMSE
=====

=====
Time Step = 20 | Hidden States = 2 | Num Layers = 2
=====

Epoch 0 MSE: 0.3221622407436371
Epoch 1 MSE: 0.27891892194747925
Epoch 2 MSE: 0.24024921655654907
Epoch 3 MSE: 0.20576758682727814
Epoch 4 MSE: 0.17484527826309204
Epoch 5 MSE: 0.14685076475143433
Epoch 6 MSE: 0.12144927680492401
Epoch 7 MSE: 0.09863541275262833
Epoch 8 MSE: 0.07859832048416138
Epoch 9 MSE: 0.061599843204021454
Epoch 10 MSE: 0.04789050295948982
Epoch 11 MSE: 0.037643350660800934
Epoch 12 MSE: 0.03089490532875061
Epoch 13 MSE: 0.027493031695485115
Epoch 14 MSE: 0.027059728279709816
Epoch 15 MSE: 0.028982290998101234
Epoch 16 MSE: 0.03245070204138756
Epoch 17 MSE: 0.036555781960487366

Epoch	18	MSE:	0.04043719545006752
Epoch	19	MSE:	0.0434299036860466
Epoch	20	MSE:	0.04514726623892784
Epoch	21	MSE:	0.04548101872205734
Epoch	22	MSE:	0.04454479366540909
Epoch	23	MSE:	0.04259803518652916
Epoch	24	MSE:	0.039973512291908264
Epoch	25	MSE:	0.037017956376075745
Epoch	26	MSE:	0.034047406166791916
Epoch	27	MSE:	0.03131736069917679
Epoch	28	MSE:	0.029006430879235268
Epoch	29	MSE:	0.027212565764784813
Epoch	30	MSE:	0.025959370657801628
Epoch	31	MSE:	0.02520977519452572
Epoch	32	MSE:	0.02488354966044426
Epoch	33	MSE:	0.024875450879335403
Epoch	34	MSE:	0.02507156692445278
Epoch	35	MSE:	0.025362376123666763
Epoch	36	MSE:	0.025652095675468445
Epoch	37	MSE:	0.02586441859602928
Epoch	38	MSE:	0.025945212692022324
Epoch	39	MSE:	0.025862837210297585
Epoch	40	MSE:	0.025606654584407806
Epoch	41	MSE:	0.025184307247400284
Epoch	42	MSE:	0.024618078023195267
Epoch	43	MSE:	0.02394074946641922
Epoch	44	MSE:	0.023191148415207863
Epoch	45	MSE:	0.022409707307815552
Epoch	46	MSE:	0.021634234115481377
Epoch	47	MSE:	0.020896179601550102
Epoch	48	MSE:	0.020217759534716606
Epoch	49	MSE:	0.019610103219747543
Epoch	50	MSE:	0.019072722643613815
Epoch	51	MSE:	0.018594397231936455
Epoch	52	MSE:	0.018155382946133614
Epoch	53	MSE:	0.01773076131939888
Epoch	54	MSE:	0.017294446006417274
Epoch	55	MSE:	0.016823288053274155
Epoch	56	MSE:	0.016300613060593605
Epoch	57	MSE:	0.01571863703429699
Epoch	58	MSE:	0.015079392120242119
Epoch	59	MSE:	0.014393958263099194
Epoch	60	MSE:	0.013680252246558666
Epoch	61	MSE:	0.012959697283804417
Epoch	62	MSE:	0.012253446504473686
Epoch	63	MSE:	0.011578774079680443
Epoch	64	MSE:	0.010946273803710938
Epoch	65	MSE:	0.010358346626162529

Epoch 66 MSE: 0.009809304028749466
Epoch 67 MSE: 0.009287075139582157
Epoch 68 MSE: 0.008776305243372917
Epoch 69 MSE: 0.008262296207249165
Epoch 70 MSE: 0.007734960410743952
Epoch 71 MSE: 0.007191913202404976
Epoch 72 MSE: 0.006639763247221708
Epoch 73 MSE: 0.006093134637922049
Epoch 74 MSE: 0.005571344867348671
Epoch 75 MSE: 0.005093524232506752
Epoch 76 MSE: 0.004673514980822802
Epoch 77 MSE: 0.004316309001296759
Epoch 78 MSE: 0.004017437808215618
Epoch 79 MSE: 0.0037658566143363714
Epoch 80 MSE: 0.0035493304021656513
Epoch 81 MSE: 0.0033600018359720707
Epoch 82 MSE: 0.0031973563600331545
Epoch 83 MSE: 0.003066812874749303
Epoch 84 MSE: 0.0029744331259280443
Epoch 85 MSE: 0.0029206627514213324
Epoch 86 MSE: 0.00289706839248538
Epoch 87 MSE: 0.002888555871322751
Epoch 88 MSE: 0.0028800389263778925
Epoch 89 MSE: 0.0028632411267608404
Epoch 90 MSE: 0.0028389468789100647
Epoch 91 MSE: 0.0028133755549788475
Epoch 92 MSE: 0.0027916315011680126
Epoch 93 MSE: 0.0027730974834412336
Epoch 94 MSE: 0.002751774387434125
Epoch 95 MSE: 0.002720651915296912
Epoch 96 MSE: 0.002676458563655615
Epoch 97 MSE: 0.0026214260142296553
Epoch 98 MSE: 0.0025613214820623398
Epoch 99 MSE: 0.0025016984436661005
T-time: 3.0339999198913574

=====

Train Score: 1.49 RMSE

=====

Validation Score: 18.72 RMSE

=====

Epoch 0 MSE: 0.297961562871933
Epoch 1 MSE: 0.2620787024497986
Epoch 2 MSE: 0.22657398879528046
Epoch 3 MSE: 0.19166314601898193
Epoch 4 MSE: 0.15771439671516418
Epoch 5 MSE: 0.12510862946510315

Epoch 6 MSE: 0.0942835658788681
Epoch 7 MSE: 0.0647982805967331
Epoch 8 MSE: 0.03800031915307045
Epoch 9 MSE: 0.0169442817568779
Epoch 10 MSE: 0.003862029640004039
Epoch 11 MSE: 0.00140914146322757
Epoch 12 MSE: 0.010696016252040863
Epoch 13 MSE: 0.02509397268295288
Epoch 14 MSE: 0.03394744545221329
Epoch 15 MSE: 0.03447912260890007
Epoch 16 MSE: 0.029230255633592606
Epoch 17 MSE: 0.02174612693488598
Epoch 18 MSE: 0.01459302008152008
Epoch 19 MSE: 0.009079720824956894
Epoch 20 MSE: 0.005616957787424326
Epoch 21 MSE: 0.004040262196213007
Epoch 22 MSE: 0.003921796102076769
Epoch 23 MSE: 0.004766523838043213
Epoch 24 MSE: 0.006102390121668577
Epoch 25 MSE: 0.0075308093801140785
Epoch 26 MSE: 0.00871251430362463
Epoch 27 MSE: 0.009517575614154339
Epoch 28 MSE: 0.009908189065754414
Epoch 29 MSE: 0.009894216433167458
Epoch 30 MSE: 0.009522398002445698
Epoch 31 MSE: 0.00886671245098114
Epoch 32 MSE: 0.008017515763640404
Epoch 33 MSE: 0.007071839179843664
Epoch 34 MSE: 0.006123715080320835
Epoch 35 MSE: 0.005255219992250204
Epoch 36 MSE: 0.004528507124632597
Epoch 37 MSE: 0.0039809513837099075
Epoch 38 MSE: 0.003621883923187852
Epoch 39 MSE: 0.0034342228900641203
Epoch 40 MSE: 0.0033777186181396246
Epoch 41 MSE: 0.0033957213163375854
Epoch 42 MSE: 0.0034263411071151495
Epoch 43 MSE: 0.0034233403857797384
Epoch 44 MSE: 0.0033719725906848907
Epoch 45 MSE: 0.0032204221934080124
Epoch 46 MSE: 0.0029349145479500294
Epoch 47 MSE: 0.0025379061698913574
Epoch 48 MSE: 0.0020859644282609224
Epoch 49 MSE: 0.00164602801669389
Epoch 50 MSE: 0.0012731541646644473
Epoch 51 MSE: 0.0009978474117815495
Epoch 52 MSE: 0.0008176950505003333
Epoch 53 MSE: 0.000711524102371186

Epoch 54 MSE: 0.0006545609212480485
Epoch 55 MSE: 0.0006212094449438155
Epoch 56 MSE: 0.0005891569890081882
Epoch 57 MSE: 0.000542834575753659
Epoch 58 MSE: 0.0004755063564516604
Epoch 59 MSE: 0.00038917287020012736
Epoch 60 MSE: 0.0002922018466051668
Epoch 61 MSE: 0.00019854499259963632
Epoch 62 MSE: 0.00012452858209144324
Epoch 63 MSE: 8.281521149910986e-05
Epoch 64 MSE: 7.827435183571652e-05
Epoch 65 MSE: 0.00010480501805432141
Epoch 66 MSE: 0.00014817748160567135
Epoch 67 MSE: 0.00019119908392895013
Epoch 68 MSE: 0.00021953794930595905
Epoch 69 MSE: 0.00022618952789343894
Epoch 70 MSE: 0.00021272036246955395
Epoch 71 MSE: 0.00018725702830124646
Epoch 72 MSE: 0.00016031693667173386
Epoch 73 MSE: 0.00014050719619262964
Epoch 74 MSE: 0.00013172220496926457
Epoch 75 MSE: 0.00013273197691887617
Epoch 76 MSE: 0.00013864894572179765
Epoch 77 MSE: 0.00014345742238219827
Epoch 78 MSE: 0.00014244996418710798
Epoch 79 MSE: 0.00013372718240134418
Epoch 80 MSE: 0.00011846952111227438
Epoch 81 MSE: 0.00010008439858211204
Epoch 82 MSE: 8.271920523839071e-05
Epoch 83 MSE: 6.974201096454635e-05
Epoch 84 MSE: 6.271102029131725e-05
Epoch 85 MSE: 6.11253926763311e-05
Epoch 86 MSE: 6.293384649325162e-05
Epoch 87 MSE: 6.551459955517203e-05
Epoch 88 MSE: 6.670141738140956e-05
Epoch 89 MSE: 6.547017983393744e-05
Epoch 90 MSE: 6.208451668499038e-05
Epoch 91 MSE: 5.7731547713046893e-05
Epoch 92 MSE: 5.386580596677959e-05
Epoch 93 MSE: 5.158617932465859e-05
Epoch 94 MSE: 5.126586984260939e-05
Epoch 95 MSE: 5.25112591276411e-05
Epoch 96 MSE: 5.44309732504189e-05
Epoch 97 MSE: 5.60344269615598e-05
Epoch 98 MSE: 5.6607848819112405e-05
Epoch 99 MSE: 5.5922719184309244e-05
T-time: 2.954310894012451

```
=====
Train Score: 0.22 RMSE
=====
Validation Score: 1.16 RMSE
=====
```

```
=====
Time Step = 20 | Hidden States = 4 | Num Layers = 1
=====
```

```
Epoch 0 MSE: 0.13150110840797424
Epoch 1 MSE: 0.09961990267038345
Epoch 2 MSE: 0.07914496958255768
Epoch 3 MSE: 0.06759276241064072
Epoch 4 MSE: 0.062282297760248184
Epoch 5 MSE: 0.06058744341135025
Epoch 6 MSE: 0.06027151271700859
Epoch 7 MSE: 0.05979962646961212
Epoch 8 MSE: 0.05843152850866318
Epoch 9 MSE: 0.05606463924050331
Epoch 10 MSE: 0.05297219008207321
Epoch 11 MSE: 0.04957352951169014
Epoch 12 MSE: 0.04628126695752144
Epoch 13 MSE: 0.04341447725892067
Epoch 14 MSE: 0.0411575585603714
Epoch 15 MSE: 0.039550963789224625
Epoch 16 MSE: 0.03850703686475754
Epoch 17 MSE: 0.03784612938761711
Epoch 18 MSE: 0.03734634816646576
Epoch 19 MSE: 0.03679636865854263
Epoch 20 MSE: 0.03603914752602577
Epoch 21 MSE: 0.03499677777290344
Epoch 22 MSE: 0.0336734801530838
Epoch 23 MSE: 0.03214031085371971
Epoch 24 MSE: 0.03050883300602436
Epoch 25 MSE: 0.028900932520627975
Epoch 26 MSE: 0.027420081198215485
Epoch 27 MSE: 0.026128524914383888
Epoch 28 MSE: 0.02503422647714615
Epoch 29 MSE: 0.02409137226641178
Epoch 30 MSE: 0.023216255009174347
Epoch 31 MSE: 0.022315163165330887
Epoch 32 MSE: 0.02131510339677334
Epoch 33 MSE: 0.020185701549053192
Epoch 34 MSE: 0.018944963812828064
Epoch 35 MSE: 0.017648566514253616
Epoch 36 MSE: 0.01636810041964054
Epoch 37 MSE: 0.015165803954005241
```

Epoch	38	MSE:	0.014073267579078674
Epoch	39	MSE:	0.013080640695989132
Epoch	40	MSE:	0.01214095763862133
Epoch	41	MSE:	0.011190218850970268
Epoch	42	MSE:	0.010176819749176502
Epoch	43	MSE:	0.009087163023650646
Epoch	44	MSE:	0.007953930646181107
Epoch	45	MSE:	0.00684200506657362
Epoch	46	MSE:	0.005818046163767576
Epoch	47	MSE:	0.004917980637401342
Epoch	48	MSE:	0.004130267072468996
Epoch	49	MSE:	0.003408480668440461
Epoch	50	MSE:	0.002709138672798872
Epoch	51	MSE:	0.0020287816878408194
Epoch	52	MSE:	0.0014117861865088344
Epoch	53	MSE:	0.0009215478203259408
Epoch	54	MSE:	0.0005933180218562484
Epoch	55	MSE:	0.00040389696368947625
Epoch	56	MSE:	0.0002904135035350919
Epoch	57	MSE:	0.00020905885321553797
Epoch	58	MSE:	0.00017268426017835736
Epoch	59	MSE:	0.00022182182874530554
Epoch	60	MSE:	0.00036012069904245436
Epoch	61	MSE:	0.0005299026961438358
Epoch	62	MSE:	0.0006615917081944644
Epoch	63	MSE:	0.0007374346605502069
Epoch	64	MSE:	0.0007895224262028933
Epoch	65	MSE:	0.0008408876601606607
Epoch	66	MSE:	0.0008701222250238061
Epoch	67	MSE:	0.0008433462353423238
Epoch	68	MSE:	0.0007626520819030702
Epoch	69	MSE:	0.000663854880258441
Epoch	70	MSE:	0.0005753102013841271
Epoch	71	MSE:	0.0004952741437591612
Epoch	72	MSE:	0.0004096037591807544
Epoch	73	MSE:	0.00031875577406026423
Epoch	74	MSE:	0.00023959427198860794
Epoch	75	MSE:	0.0001859543554019183
Epoch	76	MSE:	0.00015541244647465646
Epoch	77	MSE:	0.00013586373825091869
Epoch	78	MSE:	0.00012011553917545825
Epoch	79	MSE:	0.00011077721137553453
Epoch	80	MSE:	0.00011282829655101523
Epoch	81	MSE:	0.00012514514673966914
Epoch	82	MSE:	0.0001405237417202443
Epoch	83	MSE:	0.00015245267422869802
Epoch	84	MSE:	0.00016006853547878563
Epoch	85	MSE:	0.00016645969299133867

```

Epoch 86 MSE: 0.00017348944675177336
Epoch 87 MSE: 0.00017930654576048255
Epoch 88 MSE: 0.00018067187920678407
Epoch 89 MSE: 0.0001766977657098323
Epoch 90 MSE: 0.00016963751113507897
Epoch 91 MSE: 0.00016228746972046793
Epoch 92 MSE: 0.0001553410111228004
Epoch 93 MSE: 0.00014758484030608088
Epoch 94 MSE: 0.00013823194603901356
Epoch 95 MSE: 0.00012837871327064931
Epoch 96 MSE: 0.00011999591515632346
Epoch 97 MSE: 0.00011394401371944696
Epoch 98 MSE: 0.00010946145630441606
Epoch 99 MSE: 0.00010552418098086491
T-time: 1.8887569904327393

```

```

=====
Train Score: 0.31 RMSE
=====
Validation Score: 10.00 RMSE
=====

```

```

Epoch 0 MSE: 0.11875616759061813
Epoch 1 MSE: 0.10860424488782883
Epoch 2 MSE: 0.09938566386699677
Epoch 3 MSE: 0.09090611338615417
Epoch 4 MSE: 0.08317798376083374
Epoch 5 MSE: 0.07624413818120956
Epoch 6 MSE: 0.0701715275645256
Epoch 7 MSE: 0.06496895849704742
Epoch 8 MSE: 0.06069688871502876
Epoch 9 MSE: 0.0573975034058094
Epoch 10 MSE: 0.055055081844329834
Epoch 11 MSE: 0.05353667959570885
Epoch 12 MSE: 0.05258754640817642
Epoch 13 MSE: 0.05194589123129845
Epoch 14 MSE: 0.05142199248075485
Epoch 15 MSE: 0.05089385807514191
Epoch 16 MSE: 0.050290822982788086
Epoch 17 MSE: 0.04958265647292137
Epoch 18 MSE: 0.04877021908760071
Epoch 19 MSE: 0.047875795513391495
Epoch 20 MSE: 0.04693381488323212
Epoch 21 MSE: 0.04598284140229225
Epoch 22 MSE: 0.04505929350852966
Epoch 23 MSE: 0.0441933274269104
Epoch 24 MSE: 0.043406516313552856
Epoch 25 MSE: 0.04271119832992554

```

Epoch	26	MSE:	0.04211100935935974
Epoch	27	MSE:	0.041602250188589096
Epoch	28	MSE:	0.04117562249302864
Epoch	29	MSE:	0.040818218141794205
Epoch	30	MSE:	0.040515314787626266
Epoch	31	MSE:	0.04025202617049217
Epoch	32	MSE:	0.04001453146338463
Epoch	33	MSE:	0.039791032671928406
Epoch	34	MSE:	0.03957226499915123
Epoch	35	MSE:	0.03935173898935318
Epoch	36	MSE:	0.03912566974759102
Epoch	37	MSE:	0.038892712444067
Epoch	38	MSE:	0.038653548806905746
Epoch	39	MSE:	0.038410358130931854
Epoch	40	MSE:	0.03816628456115723
Epoch	41	MSE:	0.037924908101558685
Epoch	42	MSE:	0.03768973797559738
Epoch	43	MSE:	0.03746384009718895
Epoch	44	MSE:	0.03724951669573784
Epoch	45	MSE:	0.03704812750220299
Epoch	46	MSE:	0.036860015243291855
Epoch	47	MSE:	0.036684565246105194
Epoch	48	MSE:	0.0365203358232975
Epoch	49	MSE:	0.036365289241075516
Epoch	50	MSE:	0.036217037588357925
Epoch	51	MSE:	0.03607311472296715
Epoch	52	MSE:	0.03593124821782112
Epoch	53	MSE:	0.03578951582312584
Epoch	54	MSE:	0.03564648702740669
Epoch	55	MSE:	0.035501305013895035
Epoch	56	MSE:	0.03535360470414162
Epoch	57	MSE:	0.03520349785685539
Epoch	58	MSE:	0.03505135700106621
Epoch	59	MSE:	0.03489777073264122
Epoch	60	MSE:	0.03474331274628639
Epoch	61	MSE:	0.03458847478032112
Epoch	62	MSE:	0.03443354368209839
Epoch	63	MSE:	0.03427858650684357
Epoch	64	MSE:	0.03412340581417084
Epoch	65	MSE:	0.033967580646276474
Epoch	66	MSE:	0.033810507506132126
Epoch	67	MSE:	0.033651478588581085
Epoch	68	MSE:	0.03348973020911217
Epoch	69	MSE:	0.033324502408504486
Epoch	70	MSE:	0.033155109733343124
Epoch	71	MSE:	0.032980963587760925
Epoch	72	MSE:	0.032801553606987
Epoch	73	MSE:	0.03261649236083031

```

Epoch 74 MSE: 0.032425474375486374
Epoch 75 MSE: 0.03222823515534401
Epoch 76 MSE: 0.03202454000711441
Epoch 77 MSE: 0.03181414678692818
Epoch 78 MSE: 0.03159676119685173
Epoch 79 MSE: 0.031372036784887314
Epoch 80 MSE: 0.03113955445587635
Epoch 81 MSE: 0.0308988094329834
Epoch 82 MSE: 0.030649244785308838
Epoch 83 MSE: 0.030390236526727676
Epoch 84 MSE: 0.03012111410498619
Epoch 85 MSE: 0.02984119951725006
Epoch 86 MSE: 0.02954978123307228
Epoch 87 MSE: 0.029246171936392784
Epoch 88 MSE: 0.02892967313528061
Epoch 89 MSE: 0.028599591925740242
Epoch 90 MSE: 0.028255239129066467
Epoch 91 MSE: 0.027895910665392876
Epoch 92 MSE: 0.02752087265253067
Epoch 93 MSE: 0.027129368856549263
Epoch 94 MSE: 0.02672058343887329
Epoch 95 MSE: 0.026293663308024406
Epoch 96 MSE: 0.02584848739206791
Epoch 97 MSE: 0.025391479954123497
Epoch 98 MSE: 0.024937951937317848
Epoch 99 MSE: 0.02447507716715336
T-time: 1.9537885189056396

```

```
=====
```

```
Train Score: 4.67 RMSE
```

```
=====
```

```
Validation Score: 29.53 RMSE
```

```
=====
```

```
=====
```

```
Time Step = 20 | Hidden States = 4 | Num Layers = 2
```

```
=====
```

```

Epoch 0 MSE: 0.14334483444690704
Epoch 1 MSE: 0.0771237388253212
Epoch 2 MSE: 0.03169119730591774
Epoch 3 MSE: 0.011012035422027111
Epoch 4 MSE: 0.013505011796951294
Epoch 5 MSE: 0.027539493516087532
Epoch 6 MSE: 0.037603095173835754
Epoch 7 MSE: 0.038004592061042786
Epoch 8 MSE: 0.031059544533491135
Epoch 9 MSE: 0.021251199766993523

```

Epoch	10	MSE:	0.012524732388556004
Epoch	11	MSE:	0.0072272527031600475
Epoch	12	MSE:	0.0058388542383909225
Epoch	13	MSE:	0.0073640430346131325
Epoch	14	MSE:	0.010120854713022709
Epoch	15	MSE:	0.01250118762254715
Epoch	16	MSE:	0.013444487936794758
Epoch	17	MSE:	0.012596268206834793
Epoch	18	MSE:	0.010237338952720165
Epoch	19	MSE:	0.007083946373313665
Epoch	20	MSE:	0.004026561509817839
Epoch	21	MSE:	0.0018495575059205294
Epoch	22	MSE:	0.0009819628903642297
Epoch	23	MSE:	0.001357759116217494
Epoch	24	MSE:	0.002463115146383643
Epoch	25	MSE:	0.00357668474316597
Epoch	26	MSE:	0.004095400217920542
Epoch	27	MSE:	0.0037783407606184483
Epoch	28	MSE:	0.002797173336148262
Epoch	29	MSE:	0.0015996524598449469
Epoch	30	MSE:	0.0006763892015442252
Epoch	31	MSE:	0.0003400748537387699
Epoch	32	MSE:	0.0006061470485292375
Epoch	33	MSE:	0.0012197202304378152
Epoch	34	MSE:	0.0018074300605803728
Epoch	35	MSE:	0.002068799454718828
Epoch	36	MSE:	0.0019051248673349619
Epoch	37	MSE:	0.0014304250944405794
Epoch	38	MSE:	0.0008804212557151914
Epoch	39	MSE:	0.0004819741006940603
Epoch	40	MSE:	0.0003506467037368566
Epoch	41	MSE:	0.00045837441575713456
Epoch	42	MSE:	0.0006739501841366291
Epoch	43	MSE:	0.0008444260456599295
Epoch	44	MSE:	0.0008712830021977425
Epoch	45	MSE:	0.0007461814093403518
Epoch	46	MSE:	0.0005373554886318743
Epoch	47	MSE:	0.00034283226705156267
Epoch	48	MSE:	0.00023875865736044943
Epoch	49	MSE:	0.0002476582885719836
Epoch	50	MSE:	0.00033742657979018986
Epoch	51	MSE:	0.00044567236909642816
Epoch	52	MSE:	0.0005134740495122969
Epoch	53	MSE:	0.0005114704254083335
Epoch	54	MSE:	0.00044796260772272944
Epoch	55	MSE:	0.00035851928987540305
Epoch	56	MSE:	0.00028476741863414645
Epoch	57	MSE:	0.0002536349056754261

Epoch 58 MSE: 0.0002666363143362105
Epoch 59 MSE: 0.0003030527732335031
Epoch 60 MSE: 0.00033376243663951755
Epoch 61 MSE: 0.00033748289570212364
Epoch 62 MSE: 0.00031076473533175886
Epoch 63 MSE: 0.00026729280943982303
Epoch 64 MSE: 0.00022819824516773224
Epoch 65 MSE: 0.0002097164688166231
Epoch 66 MSE: 0.0002151568332919851
Epoch 67 MSE: 0.00023497662914451212
Epoch 68 MSE: 0.00025383796310052276
Epoch 69 MSE: 0.0002598176070023328
Epoch 70 MSE: 0.00025037722662091255
Epoch 71 MSE: 0.00023219938157126307
Epoch 72 MSE: 0.0002158486604457721
Epoch 73 MSE: 0.0002090392808895558
Epoch 74 MSE: 0.00021258479682728648
Epoch 75 MSE: 0.00022101817012298852
Epoch 76 MSE: 0.00022684001305606216
Epoch 77 MSE: 0.00022532980074174702
Epoch 78 MSE: 0.00021694893075618893
Epoch 79 MSE: 0.000206250449991785
Epoch 80 MSE: 0.00019849443924613297
Epoch 81 MSE: 0.0001963846734724939
Epoch 82 MSE: 0.00019888347014784813
Epoch 83 MSE: 0.00020248845976311713
Epoch 84 MSE: 0.00020378567569423467
Epoch 85 MSE: 0.00020150939235463738
Epoch 86 MSE: 0.0001969278382603079
Epoch 87 MSE: 0.00019259123655501753
Epoch 88 MSE: 0.00019048973626922816
Epoch 89 MSE: 0.00019086652901023626
Epoch 90 MSE: 0.00019233618513680995
Epoch 91 MSE: 0.00019303012231830508
Epoch 92 MSE: 0.00019187701400369406
Epoch 93 MSE: 0.00018916981935035437
Epoch 94 MSE: 0.00018615872249938548
Epoch 95 MSE: 0.00018408367759548128
Epoch 96 MSE: 0.00018336866924073547
Epoch 97 MSE: 0.0001834852882893756
Epoch 98 MSE: 0.00018347089644521475
Epoch 99 MSE: 0.00018265207472722977
T-time: 3.0723373889923096

=====

Train Score: 0.40 RMSE

=====

Validation Score: 10.11 RMSE

=====

Epoch	0	MSE:	0.2550846040248871
Epoch	1	MSE:	0.20965315401554108
Epoch	2	MSE:	0.1708953082561493
Epoch	3	MSE:	0.13941694796085358
Epoch	4	MSE:	0.11258117109537125
Epoch	5	MSE:	0.0899198055267334
Epoch	6	MSE:	0.0709933191537857
Epoch	7	MSE:	0.05540340766310692
Epoch	8	MSE:	0.04275799170136452
Epoch	9	MSE:	0.03267022967338562
Epoch	10	MSE:	0.024770090356469154
Epoch	11	MSE:	0.018663005903363228
Epoch	12	MSE:	0.013972103595733643
Epoch	13	MSE:	0.010352651588618755
Epoch	14	MSE:	0.007528757676482201
Epoch	15	MSE:	0.005551889538764954
Epoch	16	MSE:	0.0035988017916679382
Epoch	17	MSE:	0.0018786754226312041
Epoch	18	MSE:	0.0009374682558700442
Epoch	19	MSE:	0.0009088294464163482
Epoch	20	MSE:	0.0012743272818624973
Epoch	21	MSE:	0.0013502002693712711
Epoch	22	MSE:	0.001258679199963808
Epoch	23	MSE:	0.0013215410290285945
Epoch	24	MSE:	0.0016296820249408484
Epoch	25	MSE:	0.0020280107855796814
Epoch	26	MSE:	0.0022279920522123575
Epoch	27	MSE:	0.0020855567418038845
Epoch	28	MSE:	0.0016608773730695248
Epoch	29	MSE:	0.0011401731753721833
Epoch	30	MSE:	0.000715788803063333
Epoch	31	MSE:	0.0004797110450454056
Epoch	32	MSE:	0.0004223281343467534
Epoch	33	MSE:	0.00042258520261384547
Epoch	34	MSE:	0.0003453076060395688
Epoch	35	MSE:	0.00022173549223225564
Epoch	36	MSE:	0.00016730211791582406
Epoch	37	MSE:	0.00023457326460629702
Epoch	38	MSE:	0.00037376198451966047
Epoch	39	MSE:	0.000489494763314724
Epoch	40	MSE:	0.0005190781666897237
Epoch	41	MSE:	0.0004699661221820861
Epoch	42	MSE:	0.0003984368813689798
Epoch	43	MSE:	0.0003570067638065666
Epoch	44	MSE:	0.00035637334804050624
Epoch	45	MSE:	0.00035483899409882724

Epoch 46 MSE: 0.00029466807609423995
 Epoch 47 MSE: 0.00019539987260941416
 Epoch 48 MSE: 0.00012499500007834285
 Epoch 49 MSE: 0.00011202224413864315
 Epoch 50 MSE: 0.00012422727013472468
 Epoch 51 MSE: 0.00012027863704133779
 Epoch 52 MSE: 9.361421689391136e-05
 Epoch 53 MSE: 7.342580647673458e-05
 Epoch 54 MSE: 8.703218190930784e-05
 Epoch 55 MSE: 0.00011941004049731418
 Epoch 56 MSE: 0.00013054058945272118
 Epoch 57 MSE: 0.00011153476953040808
 Epoch 58 MSE: 9.133484854828566e-05
 Epoch 59 MSE: 8.865477138897404e-05
 Epoch 60 MSE: 9.01499661267735e-05
 Epoch 61 MSE: 7.617472147103399e-05
 Epoch 62 MSE: 5.0264254241483286e-05
 Epoch 63 MSE: 3.3158863516291603e-05
 Epoch 64 MSE: 3.388381446711719e-05
 Epoch 65 MSE: 3.8454287278000265e-05
 Epoch 66 MSE: 3.333490531076677e-05
 Epoch 67 MSE: 2.6499337764107622e-05
 Epoch 68 MSE: 3.0048042390262708e-05
 Epoch 69 MSE: 3.893994289683178e-05
 Epoch 70 MSE: 4.0904589695855975e-05
 Epoch 71 MSE: 3.507962537696585e-05
 Epoch 72 MSE: 3.0845447327010334e-05
 Epoch 73 MSE: 3.185156310792081e-05
 Epoch 74 MSE: 3.122929410892539e-05
 Epoch 75 MSE: 2.507691169739701e-05
 Epoch 76 MSE: 1.9223547496949323e-05
 Epoch 77 MSE: 1.8424787413096055e-05
 Epoch 78 MSE: 1.9737934053409845e-05
 Epoch 79 MSE: 1.8953121980302967e-05
 Epoch 80 MSE: 1.720967520668637e-05
 Epoch 81 MSE: 1.7950973415281624e-05
 Epoch 82 MSE: 2.057048368442338e-05
 Epoch 83 MSE: 2.1521154849324375e-05
 Epoch 84 MSE: 2.0223060346324928e-05
 Epoch 85 MSE: 1.9296550817671232e-05
 Epoch 86 MSE: 1.9637114746728912e-05
 Epoch 87 MSE: 1.9388275177334435e-05
 Epoch 88 MSE: 1.7702337572700344e-05
 Epoch 89 MSE: 1.625109689484816e-05
 Epoch 90 MSE: 1.6244019207078964e-05
 Epoch 91 MSE: 1.662002432567533e-05
 Epoch 92 MSE: 1.62787673616549e-05
 Epoch 93 MSE: 1.5934980183374137e-05

Epoch 94 MSE: 1.643188443267718e-05
Epoch 95 MSE: 1.708767013042234e-05
Epoch 96 MSE: 1.6994628822430968e-05
Epoch 97 MSE: 1.6547352061024867e-05
Epoch 98 MSE: 1.6487458196934313e-05
Epoch 99 MSE: 1.6537869669264182e-05
T-time: 3.044351577758789

=====
Train Score: 0.12 RMSE
=====
Validation Score: 5.85 RMSE
=====

=====
Time Step = 20 | Hidden States = 8 | Num Layers = 1
=====

Epoch 0 MSE: 0.0527842678129673
Epoch 1 MSE: 0.033607058227062225
Epoch 2 MSE: 0.02729419432580471
Epoch 3 MSE: 0.031045515090227127
Epoch 4 MSE: 0.03097517229616642
Epoch 5 MSE: 0.0260578952729702
Epoch 6 MSE: 0.02095322497189045
Epoch 7 MSE: 0.01810598000884056
Epoch 8 MSE: 0.017289673909544945
Epoch 9 MSE: 0.01700352504849434
Epoch 10 MSE: 0.015787092968821526
Epoch 11 MSE: 0.01306844037026167
Epoch 12 MSE: 0.009403295814990997
Epoch 13 MSE: 0.006175782065838575
Epoch 14 MSE: 0.004754423629492521
Epoch 15 MSE: 0.004778053145855665
Epoch 16 MSE: 0.0037487701047211885
Epoch 17 MSE: 0.0012004730524495244
Epoch 18 MSE: 0.0003792186616919935
Epoch 19 MSE: 0.002634403295814991
Epoch 20 MSE: 0.0034192318562418222
Epoch 21 MSE: 0.002201696392148733
Epoch 22 MSE: 0.002727847546339035
Epoch 23 MSE: 0.0033487596083432436
Epoch 24 MSE: 0.0019425706705078483
Epoch 25 MSE: 0.0007563027902506292
Epoch 26 MSE: 0.0007302159792743623
Epoch 27 MSE: 0.0008453840855509043
Epoch 28 MSE: 0.0005777942133136094
Epoch 29 MSE: 0.0002932864590547979

Epoch 30 MSE: 0.00037036306457594037
 Epoch 31 MSE: 0.0007205598521977663
 Epoch 32 MSE: 0.0009847291512414813
 Epoch 33 MSE: 0.000966812192928046
 Epoch 34 MSE: 0.0007821757462807
 Epoch 35 MSE: 0.0006495261914096773
 Epoch 36 MSE: 0.000642504368443042
 Epoch 37 MSE: 0.0006533821579068899
 Epoch 38 MSE: 0.0005504863802343607
 Epoch 39 MSE: 0.0003380657872185111
 Epoch 40 MSE: 0.00015514952247031033
 Epoch 41 MSE: 0.00011827681737486273
 Epoch 42 MSE: 0.00018355347856413573
 Epoch 43 MSE: 0.00021129670494701713
 Epoch 44 MSE: 0.0001633906940696761
 Epoch 45 MSE: 0.00014163253945298493
 Epoch 46 MSE: 0.00020845689869020134
 Epoch 47 MSE: 0.0002831336169037968
 Epoch 48 MSE: 0.00026966514997184277
 Epoch 49 MSE: 0.0001951527374330908
 Epoch 50 MSE: 0.00015049483045004308
 Epoch 51 MSE: 0.0001524468680145219
 Epoch 52 MSE: 0.00014250243839342147
 Epoch 53 MSE: 9.658630006015301e-05
 Epoch 54 MSE: 5.795023389509879e-05
 Epoch 55 MSE: 6.263986142585054e-05
 Epoch 56 MSE: 9.076762944459915e-05
 Epoch 57 MSE: 0.00010361338354414329
 Epoch 58 MSE: 9.526342182653025e-05
 Epoch 59 MSE: 8.93671385711059e-05
 Epoch 60 MSE: 9.86564700724557e-05
 Epoch 61 MSE: 0.00010784040932776406
 Epoch 62 MSE: 9.89845793810673e-05
 Epoch 63 MSE: 7.800159801263362e-05
 Epoch 64 MSE: 6.446017505368218e-05
 Epoch 65 MSE: 6.379968544933945e-05
 Epoch 66 MSE: 6.37236880720593e-05
 Epoch 67 MSE: 5.624253390124068e-05
 Epoch 68 MSE: 4.9524711357662454e-05
 Epoch 69 MSE: 5.300314660416916e-05
 Epoch 70 MSE: 6.14994132774882e-05
 Epoch 71 MSE: 6.373723590513691e-05
 Epoch 72 MSE: 5.956153472652659e-05
 Epoch 73 MSE: 5.735424201702699e-05
 Epoch 74 MSE: 5.8805693697649986e-05
 Epoch 75 MSE: 5.765194873674773e-05
 Epoch 76 MSE: 5.1812432502629235e-05
 Epoch 77 MSE: 4.686461397795938e-05

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Epoch 78 MSE: 4.661463026423007e-05
Epoch 79 MSE: 4.7889156121527776e-05
Epoch 80 MSE: 4.702334990724921e-05
Epoch 81 MSE: 4.5588662032969296e-05
Epoch 82 MSE: 4.6451546950265765e-05
Epoch 83 MSE: 4.843365968554281e-05
Epoch 84 MSE: 4.849215110880323e-05
Epoch 85 MSE: 4.665035521611571e-05
Epoch 86 MSE: 4.535672997008078e-05
Epoch 87 MSE: 4.522270683082752e-05
Epoch 88 MSE: 4.458209878066555e-05
Epoch 89 MSE: 4.292494850233197e-05
Epoch 90 MSE: 4.181574331596494e-05
Epoch 91 MSE: 4.206608355161734e-05
Epoch 92 MSE: 4.249731864547357e-05
Epoch 93 MSE: 4.216980960336514e-05
Epoch 94 MSE: 4.177328446530737e-05
Epoch 95 MSE: 4.197633097646758e-05
Epoch 96 MSE: 4.2125117033720016e-05
Epoch 97 MSE: 4.1543560655554757e-05
Epoch 98 MSE: 4.074180105817504e-05
Epoch 99 MSE: 4.0397113480139524e-05
T-time: 2.368370294570923

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=====
Train Score: 0.19 RMSE
=====
Validation Score: 6.41 RMSE
=====

```

```

Epoch 0 MSE: 0.051062941551208496
Epoch 1 MSE: 0.03999146819114685
Epoch 2 MSE: 0.03518593683838844
Epoch 3 MSE: 0.03586225584149361
Epoch 4 MSE: 0.03642748296260834
Epoch 5 MSE: 0.03458893299102783
Epoch 6 MSE: 0.031704436987638474
Epoch 7 MSE: 0.029234107583761215
Epoch 8 MSE: 0.02769237756729126
Epoch 9 MSE: 0.02682698890566826
Epoch 10 MSE: 0.02605593577027321
Epoch 11 MSE: 0.02491629868745804
Epoch 12 MSE: 0.023238487541675568
Epoch 13 MSE: 0.021097302436828613
Epoch 14 MSE: 0.01872711069881916
Epoch 15 MSE: 0.016384322196245193
Epoch 16 MSE: 0.014461628161370754
Epoch 17 MSE: 0.01327712181955576

```

Epoch	18	MSE:	0.012049922719597816
Epoch	19	MSE:	0.010776203125715256
Epoch	20	MSE:	0.00947749987244606
Epoch	21	MSE:	0.008200135082006454
Epoch	22	MSE:	0.006950742565095425
Epoch	23	MSE:	0.0057051037438213825
Epoch	24	MSE:	0.004444983322173357
Epoch	25	MSE:	0.003240748541429639
Epoch	26	MSE:	0.0022044300567358732
Epoch	27	MSE:	0.0013892556307837367
Epoch	28	MSE:	0.0007624808931723237
Epoch	29	MSE:	0.0003879956784658134
Epoch	30	MSE:	0.0004044284869451076
Epoch	31	MSE:	0.0006753685884177685
Epoch	32	MSE:	0.0011379948118701577
Epoch	33	MSE:	0.0016910627018660307
Epoch	34	MSE:	0.001988198608160019
Epoch	35	MSE:	0.0020920296665281057
Epoch	36	MSE:	0.001882838667370379
Epoch	37	MSE:	0.001544222584925592
Epoch	38	MSE:	0.0011667313519865274
Epoch	39	MSE:	0.0008001386886462569
Epoch	40	MSE:	0.0005566774634644389
Epoch	41	MSE:	0.00039411982288584113
Epoch	42	MSE:	0.00031961954664438963
Epoch	43	MSE:	0.00032887517591007054
Epoch	44	MSE:	0.0003648933197837323
Epoch	45	MSE:	0.00042377266800031066
Epoch	46	MSE:	0.000495244690682739
Epoch	47	MSE:	0.000546016963198781
Epoch	48	MSE:	0.0005785456742160022
Epoch	49	MSE:	0.0005939549882896245
Epoch	50	MSE:	0.0005760466447100043
Epoch	51	MSE:	0.000532386009581387
Epoch	52	MSE:	0.00047114171320572495
Epoch	53	MSE:	0.0003845153551083058
Epoch	54	MSE:	0.00028124250820837915
Epoch	55	MSE:	0.00017754669534042478
Epoch	56	MSE:	9.262253297492862e-05
Epoch	57	MSE:	7.857759192120284e-05
Epoch	58	MSE:	0.0001523667451692745
Epoch	59	MSE:	0.00021830927289556712
Epoch	60	MSE:	0.0002061078994302079
Epoch	61	MSE:	0.00013960177602712065
Epoch	62	MSE:	7.278155680978671e-05
Epoch	63	MSE:	5.1074726798105985e-05
Epoch	64	MSE:	6.325664435280487e-05
Epoch	65	MSE:	7.791019743308425e-05

Epoch 66 MSE: 9.220347419613972e-05
Epoch 67 MSE: 0.00010406207729829475
Epoch 68 MSE: 0.00010029717668658122
Epoch 69 MSE: 8.836589404381812e-05
Epoch 70 MSE: 7.809499220456928e-05
Epoch 71 MSE: 6.381219282047823e-05
Epoch 72 MSE: 4.871859709965065e-05
Epoch 73 MSE: 4.088219066034071e-05
Epoch 74 MSE: 3.672304956126027e-05
Epoch 75 MSE: 3.6944362364010885e-05
Epoch 76 MSE: 4.292594894650392e-05
Epoch 77 MSE: 4.506539335125126e-05
Epoch 78 MSE: 4.4109383452450857e-05
Epoch 79 MSE: 3.714916601893492e-05
Epoch 80 MSE: 2.7870886697201058e-05
Epoch 81 MSE: 2.3103728381101973e-05
Epoch 82 MSE: 2.103295992128551e-05
Epoch 83 MSE: 2.3390968635794707e-05
Epoch 84 MSE: 2.682990816538222e-05
Epoch 85 MSE: 2.8946988095412962e-05
Epoch 86 MSE: 3.030644620594103e-05
Epoch 87 MSE: 2.87316543108318e-05
Epoch 88 MSE: 2.64839363808278e-05
Epoch 89 MSE: 2.4148755983333103e-05
Epoch 90 MSE: 2.2522162907989696e-05
Epoch 91 MSE: 2.317208782187663e-05
Epoch 92 MSE: 2.4190894691855647e-05
Epoch 93 MSE: 2.5392509996891022e-05
Epoch 94 MSE: 2.5229914172086865e-05
Epoch 95 MSE: 2.368551940890029e-05
Epoch 96 MSE: 2.2150612494442612e-05
Epoch 97 MSE: 2.0729319658130407e-05
Epoch 98 MSE: 2.0498724552453496e-05
Epoch 99 MSE: 2.0714160200441256e-05
T-time: 2.4798943996429443

=====
Train Score: 0.14 RMSE
=====
Validation Score: 2.07 RMSE
=====

=====
Time Step = 20 | Hidden States = 8 | Num Layers = 2
=====

Epoch 0 MSE: 0.04952426254749298
Epoch 1 MSE: 0.036013469099998474

Epoch 2 MSE: 0.04220707714557648
Epoch 3 MSE: 0.03397147357463837
Epoch 4 MSE: 0.026170630007982254
Epoch 5 MSE: 0.025158515200018883
Epoch 6 MSE: 0.02567467838525772
Epoch 7 MSE: 0.021704761311411858
Epoch 8 MSE: 0.014898579567670822
Epoch 9 MSE: 0.010468153282999992
Epoch 10 MSE: 0.010068998672068119
Epoch 11 MSE: 0.007948752492666245
Epoch 12 MSE: 0.002451049629598856
Epoch 13 MSE: 0.0010973798343911767
Epoch 14 MSE: 0.0047994074411690235
Epoch 15 MSE: 0.0036800107918679714
Epoch 16 MSE: 0.0045299772173166275
Epoch 17 MSE: 0.006031800527125597
Epoch 18 MSE: 0.003006525104865432
Epoch 19 MSE: 0.0017825885443016887
Epoch 20 MSE: 0.0019478130852803588
Epoch 21 MSE: 0.0011439495719969273
Epoch 22 MSE: 0.0004836340667679906
Epoch 23 MSE: 0.0009379183175042272
Epoch 24 MSE: 0.0017570145428180695
Epoch 25 MSE: 0.001990336924791336
Epoch 26 MSE: 0.0017038615187630057
Epoch 27 MSE: 0.0015051978407427669
Epoch 28 MSE: 0.0015903894091024995
Epoch 29 MSE: 0.001586827216669917
Epoch 30 MSE: 0.001188503229059279
Epoch 31 MSE: 0.000637293909676373
Epoch 32 MSE: 0.0003994397702626884
Epoch 33 MSE: 0.0005010399036109447
Epoch 34 MSE: 0.0005360940122045577
Epoch 35 MSE: 0.00039184652268886566
Epoch 36 MSE: 0.00041271603549830616
Epoch 37 MSE: 0.0006690514856018126
Epoch 38 MSE: 0.0007672138162888587
Epoch 39 MSE: 0.0005895008216612041
Epoch 40 MSE: 0.0004510378639679402
Epoch 41 MSE: 0.00045150594087317586
Epoch 42 MSE: 0.0003836370597127825
Epoch 43 MSE: 0.00022831578098703176
Epoch 44 MSE: 0.00017601094441488385
Epoch 45 MSE: 0.00025537132751196623
Epoch 46 MSE: 0.00031429051887243986
Epoch 47 MSE: 0.00029484438709914684
Epoch 48 MSE: 0.0002834045444615185
Epoch 49 MSE: 0.0003173686272930354

Epoch	50	MSE:	0.0003213116724509746
Epoch	51	MSE:	0.0002560626599006355
Epoch	52	MSE:	0.00019137182971462607
Epoch	53	MSE:	0.00018109513621311635
Epoch	54	MSE:	0.00018226038082502782
Epoch	55	MSE:	0.000157597751240246
Epoch	56	MSE:	0.00014848430873826146
Epoch	57	MSE:	0.00017917758668772876
Epoch	58	MSE:	0.000199176836758852
Epoch	59	MSE:	0.00018203664512839168
Epoch	60	MSE:	0.00016696045349817723
Epoch	61	MSE:	0.00016738651902414858
Epoch	62	MSE:	0.00015301025996450335
Epoch	63	MSE:	0.00012692069867625833
Epoch	64	MSE:	0.00012079757289029658
Epoch	65	MSE:	0.00013021094491705298
Epoch	66	MSE:	0.00013026606757193804
Epoch	67	MSE:	0.00012582792260218412
Epoch	68	MSE:	0.000131158041767776
Epoch	69	MSE:	0.00013500383647624403
Epoch	70	MSE:	0.0001255514071090147
Epoch	71	MSE:	0.0001149943855125457
Epoch	72	MSE:	0.00011284036736469716
Epoch	73	MSE:	0.00010969607683364302
Epoch	74	MSE:	0.0001028960250550881
Epoch	75	MSE:	0.00010250233754049987
Epoch	76	MSE:	0.0001069468489731662
Epoch	77	MSE:	0.00010627409938024357
Epoch	78	MSE:	0.00010303071030648425
Epoch	79	MSE:	0.00010282260336680338
Epoch	80	MSE:	0.00010084781388286501
Epoch	81	MSE:	9.531758405501023e-05
Epoch	82	MSE:	9.25324420677498e-05
Epoch	83	MSE:	9.271293674828485e-05
Epoch	84	MSE:	9.132778359344229e-05
Epoch	85	MSE:	9.001295256894082e-05
Epoch	86	MSE:	9.088174556382e-05
Epoch	87	MSE:	9.055033297045156e-05
Epoch	88	MSE:	8.80849183886312e-05
Epoch	89	MSE:	8.653698023408651e-05
Epoch	90	MSE:	8.554450323572382e-05
Epoch	91	MSE:	8.344200614374131e-05
Epoch	92	MSE:	8.205576887121424e-05
Epoch	93	MSE:	8.210788655560464e-05
Epoch	94	MSE:	8.15613311715424e-05
Epoch	95	MSE:	8.055901707848534e-05
Epoch	96	MSE:	8.021085523068905e-05
Epoch	97	MSE:	7.93965591583401e-05

Epoch 98 MSE: 7.785463822074234e-05
Epoch 99 MSE: 7.690577331231907e-05
T-time: 4.258131265640259

=====

Train Score: 0.26 RMSE

=====

Validation Score: 8.88 RMSE

=====

Epoch 0 MSE: 0.03801354393362999
Epoch 1 MSE: 0.03231310099363327
Epoch 2 MSE: 0.033228594809770584
Epoch 3 MSE: 0.032042235136032104
Epoch 4 MSE: 0.029601454734802246
Epoch 5 MSE: 0.027956893667578697
Epoch 6 MSE: 0.026787491515278816
Epoch 7 MSE: 0.025032859295606613
Epoch 8 MSE: 0.0223383866250515
Epoch 9 MSE: 0.019487174227833748
Epoch 10 MSE: 0.017636461183428764
Epoch 11 MSE: 0.016014425083994865
Epoch 12 MSE: 0.013053761795163155
Epoch 13 MSE: 0.010477731004357338
Epoch 14 MSE: 0.009034672752022743
Epoch 15 MSE: 0.006561379414051771
Epoch 16 MSE: 0.004736900795251131
Epoch 17 MSE: 0.0036861577536910772
Epoch 18 MSE: 0.002670750953257084
Epoch 19 MSE: 0.0021849730983376503
Epoch 20 MSE: 0.002764027798548341
Epoch 21 MSE: 0.0027873211074620485
Epoch 22 MSE: 0.003007430350407958
Epoch 23 MSE: 0.0025733583606779575
Epoch 24 MSE: 0.001731877215206623
Epoch 25 MSE: 0.0013842781772837043
Epoch 26 MSE: 0.0011069471947848797
Epoch 27 MSE: 0.0016163198743015528
Epoch 28 MSE: 0.0019093886949121952
Epoch 29 MSE: 0.002002923283725977
Epoch 30 MSE: 0.0018666837131604552
Epoch 31 MSE: 0.0013787414645776153
Epoch 32 MSE: 0.0011336376192048192
Epoch 33 MSE: 0.0008749669650569558
Epoch 34 MSE: 0.0009343042620457709
Epoch 35 MSE: 0.001081822789274156
Epoch 36 MSE: 0.0011318182805553079
Epoch 37 MSE: 0.0011208379874005914

Epoch 38 MSE: 0.0008837123750708997
Epoch 39 MSE: 0.0007532959571108222
Epoch 40 MSE: 0.000580416526645422
Epoch 41 MSE: 0.0005826298147439957
Epoch 42 MSE: 0.0005965761956758797
Epoch 43 MSE: 0.0006343557615764439
Epoch 44 MSE: 0.0006594851147383451
Epoch 45 MSE: 0.000599266029894352
Epoch 46 MSE: 0.0005632781540043652
Epoch 47 MSE: 0.0004670620255637914
Epoch 48 MSE: 0.00043364136945456266
Epoch 49 MSE: 0.0003994687576778233
Epoch 50 MSE: 0.00040858419379219413
Epoch 51 MSE: 0.0004248431941960007
Epoch 52 MSE: 0.00042902270797640085
Epoch 53 MSE: 0.0004299055435694754
Epoch 54 MSE: 0.00039704187656752765
Epoch 55 MSE: 0.0003763578424695879
Epoch 56 MSE: 0.0003375741944182664
Epoch 57 MSE: 0.0003291362663730979
Epoch 58 MSE: 0.0003112988779321313
Epoch 59 MSE: 0.0003188509726896882
Epoch 60 MSE: 0.00031100568594411016
Epoch 61 MSE: 0.0003130347467958927
Epoch 62 MSE: 0.0002966133179143071
Epoch 63 MSE: 0.0002853843616321683
Epoch 64 MSE: 0.00026392846484668553
Epoch 65 MSE: 0.00025279331021010876
Epoch 66 MSE: 0.000239689921727404
Epoch 67 MSE: 0.00023789520491845906
Epoch 68 MSE: 0.00023220710863824934
Epoch 69 MSE: 0.00023212176165543497
Epoch 70 MSE: 0.00022347288904711604
Epoch 71 MSE: 0.00021822396956849843
Epoch 72 MSE: 0.0002064451400656253
Epoch 73 MSE: 0.00020025167032144964
Epoch 74 MSE: 0.00019113333837594837
Epoch 75 MSE: 0.000187761164852418
Epoch 76 MSE: 0.0001833838177844882
Epoch 77 MSE: 0.00018073311366606504
Epoch 78 MSE: 0.0001765077031450346
Epoch 79 MSE: 0.00017051132454071194
Epoch 80 MSE: 0.0001652275532251224
Epoch 81 MSE: 0.0001581187971169129
Epoch 82 MSE: 0.00015415434609167278
Epoch 83 MSE: 0.0001492084702476859
Epoch 84 MSE: 0.0001465760578867048
Epoch 85 MSE: 0.00014335197920445353

```

Epoch 86 MSE: 0.00013957232295069844
Epoch 87 MSE: 0.000136233662487939
Epoch 88 MSE: 0.00013138644862920046
Epoch 89 MSE: 0.00012777336814906448
Epoch 90 MSE: 0.00012383268040139228
Epoch 91 MSE: 0.00012020765279885381
Epoch 92 MSE: 0.00011741727212211117
Epoch 93 MSE: 0.00011391357838874683
Epoch 94 MSE: 0.00011083604476880282
Epoch 95 MSE: 0.0001073898165486753
Epoch 96 MSE: 0.00010363355977460742
Epoch 97 MSE: 0.00010044804366771132
Epoch 98 MSE: 9.71735134953633e-05
Epoch 99 MSE: 9.426844189874828e-05
T-time: 4.197821617126465

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=====
Train Score: 0.29 RMSE
=====
Validation Score: 6.89 RMSE
=====

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=====
Time Step = 20 | Hidden States = 16 | Num Layers = 1
=====

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```

Epoch 0 MSE: 0.11688412725925446
Epoch 1 MSE: 0.057557009160518646
Epoch 2 MSE: 0.030678261071443558
Epoch 3 MSE: 0.03053380735218525
Epoch 4 MSE: 0.040378447622060776
Epoch 5 MSE: 0.040537480264902115
Epoch 6 MSE: 0.03283340856432915
Epoch 7 MSE: 0.024670369923114777
Epoch 8 MSE: 0.01996000111103058
Epoch 9 MSE: 0.019083641469478607
Epoch 10 MSE: 0.02034519426524639
Epoch 11 MSE: 0.021152909845113754
Epoch 12 MSE: 0.019715365022420883
Epoch 13 MSE: 0.016081158071756363
Epoch 14 MSE: 0.011634751223027706
Epoch 15 MSE: 0.008115794509649277
Epoch 16 MSE: 0.006653478369116783
Epoch 17 MSE: 0.006825649179518223
Epoch 18 MSE: 0.006530591752380133
Epoch 19 MSE: 0.0041007231920957565
Epoch 20 MSE: 0.00092784856678918
Epoch 21 MSE: 0.0005236984579823911

```

Epoch	22	MSE:	0.0034884933847934008
Epoch	23	MSE:	0.004348206799477339
Epoch	24	MSE:	0.0021173551212996244
Epoch	25	MSE:	0.0013048086548224092
Epoch	26	MSE:	0.002359129022806883
Epoch	27	MSE:	0.0024402879644185305
Epoch	28	MSE:	0.001183599466457963
Epoch	29	MSE:	0.00018964995979331434
Epoch	30	MSE:	0.00024302772362716496
Epoch	31	MSE:	0.0008588089840486646
Epoch	32	MSE:	0.001253483584150672
Epoch	33	MSE:	0.0011290162801742554
Epoch	34	MSE:	0.0007311491062864661
Epoch	35	MSE:	0.00046422804007306695
Epoch	36	MSE:	0.0005161102744750679
Epoch	37	MSE:	0.000749591737985611
Epoch	38	MSE:	0.000876557023730129
Epoch	39	MSE:	0.0007357922731898725
Epoch	40	MSE:	0.0004249964258633554
Epoch	41	MSE:	0.0001836870942497626
Epoch	42	MSE:	0.00016016323934309185
Epoch	43	MSE:	0.00028601186932064593
Epoch	44	MSE:	0.000367838452802971
Epoch	45	MSE:	0.000297011632937938
Epoch	46	MSE:	0.00015473418170586228
Epoch	47	MSE:	0.00010143363761017099
Epoch	48	MSE:	0.00018500033183954656
Epoch	49	MSE:	0.0002930896880570799
Epoch	50	MSE:	0.0002975177194457501
Epoch	51	MSE:	0.00020208142814226449
Epoch	52	MSE:	0.00011580643331399187
Epoch	53	MSE:	0.00011124824231956154
Epoch	54	MSE:	0.00015372459893114865
Epoch	55	MSE:	0.00016567388956900686
Epoch	56	MSE:	0.00012320377572905272
Epoch	57	MSE:	7.126051787054166e-05
Epoch	58	MSE:	6.0531550843734294e-05
Epoch	59	MSE:	9.14981501409784e-05
Epoch	60	MSE:	0.00012279899965506047
Epoch	61	MSE:	0.00012169247929705307
Epoch	62	MSE:	9.562201739754528e-05
Epoch	63	MSE:	7.57636662456207e-05
Epoch	64	MSE:	7.908885891083628e-05
Epoch	65	MSE:	9.280514495912939e-05
Epoch	66	MSE:	9.375505760544911e-05
Epoch	67	MSE:	7.628395542269573e-05
Epoch	68	MSE:	5.672995757777244e-05
Epoch	69	MSE:	5.243369014351629e-05

```

Epoch 70 MSE: 6.205546378623694e-05
Epoch 71 MSE: 6.978850433370098e-05
Epoch 72 MSE: 6.582881906069815e-05
Epoch 73 MSE: 5.670761311193928e-05
Epoch 74 MSE: 5.429984230431728e-05
Epoch 75 MSE: 6.001130532240495e-05
Epoch 76 MSE: 6.446158658945933e-05
Epoch 77 MSE: 6.0751444834750146e-05
Epoch 78 MSE: 5.26848052686546e-05
Epoch 79 MSE: 4.850115146837197e-05
Epoch 80 MSE: 5.025079371989705e-05
Epoch 81 MSE: 5.265421714284457e-05
Epoch 82 MSE: 5.11282923980616e-05
Epoch 83 MSE: 4.7349745727842674e-05
Epoch 84 MSE: 4.5909429900348186e-05
Epoch 85 MSE: 4.7882327635306865e-05
Epoch 86 MSE: 4.9921971367439255e-05
Epoch 87 MSE: 4.907139373244718e-05
Epoch 88 MSE: 4.63221367681399e-05
Epoch 89 MSE: 4.4675707613350824e-05
Epoch 90 MSE: 4.5045784645481035e-05
Epoch 91 MSE: 4.553761027636938e-05
Epoch 92 MSE: 4.4475709728430957e-05
Epoch 93 MSE: 4.2642328480724245e-05
Epoch 94 MSE: 4.18883646489121e-05
Epoch 95 MSE: 4.249874473316595e-05
Epoch 96 MSE: 4.302180605009198e-05
Epoch 97 MSE: 4.243283183313906e-05
Epoch 98 MSE: 4.137313226237893e-05
Epoch 99 MSE: 4.094876567251049e-05
T-time: 3.5270230770111084

```

```

=====
Train Score: 0.19 RMSE
=====
Validation Score: 4.91 RMSE
=====

```

```

Epoch 0 MSE: 0.11828106641769409
Epoch 1 MSE: 0.0916253924369812
Epoch 2 MSE: 0.06765365600585938
Epoch 3 MSE: 0.046796780079603195
Epoch 4 MSE: 0.030002595856785774
Epoch 5 MSE: 0.01999811641871929
Epoch 6 MSE: 0.02015121653676033
Epoch 7 MSE: 0.027303054928779602
Epoch 8 MSE: 0.030426036566495895
Epoch 9 MSE: 0.026394810527563095

```

Epoch	10	MSE:	0.0193175021559
Epoch	11	MSE:	0.012706698849797249
Epoch	12	MSE:	0.008814768865704536
Epoch	13	MSE:	0.006721417885273695
Epoch	14	MSE:	0.005563763901591301
Epoch	15	MSE:	0.004392965696752071
Epoch	16	MSE:	0.0032462840899825096
Epoch	17	MSE:	0.0020330650731921196
Epoch	18	MSE:	0.0013393317349255085
Epoch	19	MSE:	0.0017322334460914135
Epoch	20	MSE:	0.002439511474221945
Epoch	21	MSE:	0.002229397650808096
Epoch	22	MSE:	0.0017954868962988257
Epoch	23	MSE:	0.0019241080153733492
Epoch	24	MSE:	0.002347873989492655
Epoch	25	MSE:	0.002531682373955846
Epoch	26	MSE:	0.002297573257237673
Epoch	27	MSE:	0.0017996254609897733
Epoch	28	MSE:	0.001335890032351017
Epoch	29	MSE:	0.00110893533565104
Epoch	30	MSE:	0.001126451650634408
Epoch	31	MSE:	0.0011685533681884408
Epoch	32	MSE:	0.0010594812920317054
Epoch	33	MSE:	0.0008542860159650445
Epoch	34	MSE:	0.0007030539563857019
Epoch	35	MSE:	0.0006685214466415346
Epoch	36	MSE:	0.0007043943624012172
Epoch	37	MSE:	0.000726349011529237
Epoch	38	MSE:	0.0006799536058679223
Epoch	39	MSE:	0.0005813458119519055
Epoch	40	MSE:	0.00047747211647219956
Epoch	41	MSE:	0.00038989874883554876
Epoch	42	MSE:	0.00033066325704567134
Epoch	43	MSE:	0.00028203282272443175
Epoch	44	MSE:	0.00022508030815515667
Epoch	45	MSE:	0.00016640983812976629
Epoch	46	MSE:	0.00013151705206837505
Epoch	47	MSE:	0.00013320134894456714
Epoch	48	MSE:	0.00015364638238679618
Epoch	49	MSE:	0.00015730068844277412
Epoch	50	MSE:	0.00013224984286352992
Epoch	51	MSE:	0.0001031487772706896
Epoch	52	MSE:	9.530584793537855e-05
Epoch	53	MSE:	0.0001009341431199573
Epoch	54	MSE:	9.892565867630765e-05
Epoch	55	MSE:	8.688696107128635e-05
Epoch	56	MSE:	8.031647303141654e-05
Epoch	57	MSE:	8.6749299953226e-05

Epoch 58 MSE: 9.577249875292182e-05
Epoch 59 MSE: 9.456167026655748e-05
Epoch 60 MSE: 8.390942093683407e-05
Epoch 61 MSE: 7.490302959922701e-05
Epoch 62 MSE: 7.348763756453991e-05
Epoch 63 MSE: 7.406801159959286e-05
Epoch 64 MSE: 6.996640149736777e-05
Epoch 65 MSE: 6.385231245076284e-05
Epoch 66 MSE: 6.261254020500928e-05
Epoch 67 MSE: 6.623404624406248e-05
Epoch 68 MSE: 6.819441478000954e-05
Epoch 69 MSE: 6.521305476780981e-05
Epoch 70 MSE: 6.0970065533183515e-05
Epoch 71 MSE: 5.949979095021263e-05
Epoch 72 MSE: 5.943355427007191e-05
Epoch 73 MSE: 5.743222573073581e-05
Epoch 74 MSE: 5.408327342593111e-05
Epoch 75 MSE: 5.2602463256334886e-05
Epoch 76 MSE: 5.3496543841902167e-05
Epoch 77 MSE: 5.409671211964451e-05
Epoch 78 MSE: 5.2818468248005956e-05
Epoch 79 MSE: 5.104243609821424e-05
Epoch 80 MSE: 5.0336959247943014e-05
Epoch 81 MSE: 5.001245153835043e-05
Epoch 82 MSE: 4.870578777627088e-05
Epoch 83 MSE: 4.685321982833557e-05
Epoch 84 MSE: 4.589787567965686e-05
Epoch 85 MSE: 4.591439210344106e-05
Epoch 86 MSE: 4.569891098071821e-05
Epoch 87 MSE: 4.4794302084483206e-05
Epoch 88 MSE: 4.3957388697890565e-05
Epoch 89 MSE: 4.3610274587990716e-05
Epoch 90 MSE: 4.315172918722965e-05
Epoch 91 MSE: 4.2159605072811246e-05
Epoch 92 MSE: 4.1146900912281126e-05
Epoch 93 MSE: 4.063700544065796e-05
Epoch 94 MSE: 4.035217716591433e-05
Epoch 95 MSE: 3.983163696830161e-05
Epoch 96 MSE: 3.919571463484317e-05
Epoch 97 MSE: 3.8778947782702744e-05
Epoch 98 MSE: 3.847017069347203e-05
Epoch 99 MSE: 3.794682561419904e-05
T-time: 3.5649304389953613

=====

Train Score: 0.18 RMSE

=====

Validation Score: 1.42 RMSE

=====

=====

Time Step = 20 | Hidden States = 16 | Num Layers = 2

=====

Epoch	0	MSE:	0.10661523789167404
Epoch	1	MSE:	0.04174577817320824
Epoch	2	MSE:	0.06355692446231842
Epoch	3	MSE:	0.051207415759563446
Epoch	4	MSE:	0.03490522503852844
Epoch	5	MSE:	0.03413781151175499
Epoch	6	MSE:	0.03849876672029495
Epoch	7	MSE:	0.03632911294698715
Epoch	8	MSE:	0.029340552166104317
Epoch	9	MSE:	0.024690713733434677
Epoch	10	MSE:	0.025840649381279945
Epoch	11	MSE:	0.025886939838528633
Epoch	12	MSE:	0.019996896386146545
Epoch	13	MSE:	0.014509729109704494
Epoch	14	MSE:	0.014459039084613323
Epoch	15	MSE:	0.014145593158900738
Epoch	16	MSE:	0.007502408232539892
Epoch	17	MSE:	0.0034690683241933584
Epoch	18	MSE:	0.0063647739589214325
Epoch	19	MSE:	0.0019006341462954879
Epoch	20	MSE:	0.006527863442897797
Epoch	21	MSE:	0.004894745536148548
Epoch	22	MSE:	0.0037168313283473253
Epoch	23	MSE:	0.005056479014456272
Epoch	24	MSE:	0.0013296068646013737
Epoch	25	MSE:	0.0013590173330157995
Epoch	26	MSE:	0.0026201687287539244
Epoch	27	MSE:	0.0018329037120565772
Epoch	28	MSE:	0.001132253441028297
Epoch	29	MSE:	0.0018402277491986752
Epoch	30	MSE:	0.0025750889908522367
Epoch	31	MSE:	0.0021618884056806564
Epoch	32	MSE:	0.0013628628803417087
Epoch	33	MSE:	0.001228366862051189
Epoch	34	MSE:	0.0014407708076760173
Epoch	35	MSE:	0.0011126479366794229
Epoch	36	MSE:	0.00046822914737276733
Epoch	37	MSE:	0.00046759223914705217
Epoch	38	MSE:	0.0009264703840017319
Epoch	39	MSE:	0.0008842720999382436
Epoch	40	MSE:	0.0006437855190597475
Epoch	41	MSE:	0.0008400605875067413

Epoch 42 MSE: 0.0009121146867983043
Epoch 43 MSE: 0.0005509936599992216
Epoch 44 MSE: 0.00035329931415617466
Epoch 45 MSE: 0.00046231536543928087
Epoch 46 MSE: 0.00046889655641280115
Epoch 47 MSE: 0.00035410383134149015
Epoch 48 MSE: 0.0003863151650875807
Epoch 49 MSE: 0.0005184028996154666
Epoch 50 MSE: 0.0005157889681868255
Epoch 51 MSE: 0.0003937056171707809
Epoch 52 MSE: 0.00034183089155703783
Epoch 53 MSE: 0.00036351734888739884
Epoch 54 MSE: 0.00031675983336754143
Epoch 55 MSE: 0.00023337073798757046
Epoch 56 MSE: 0.0002506514429114759
Epoch 57 MSE: 0.00031485315412282944
Epoch 58 MSE: 0.00030002035782672465
Epoch 59 MSE: 0.00026378605980426073
Epoch 60 MSE: 0.0002821263624355197
Epoch 61 MSE: 0.0002789911814033985
Epoch 62 MSE: 0.00022337798145599663
Epoch 63 MSE: 0.00020033807959407568
Epoch 64 MSE: 0.00022109370911493897
Epoch 65 MSE: 0.00022023373458068818
Epoch 66 MSE: 0.00020265780040062964
Epoch 67 MSE: 0.00021145553910173476
Epoch 68 MSE: 0.00022449909010902047
Epoch 69 MSE: 0.00020683534967247397
Epoch 70 MSE: 0.0001851048436947167
Epoch 71 MSE: 0.00018543635087553412
Epoch 72 MSE: 0.00018371152691543102
Epoch 73 MSE: 0.0001696461986284703
Epoch 74 MSE: 0.00016879275790415704
Epoch 75 MSE: 0.000178822097950615
Epoch 76 MSE: 0.00017477790242992342
Epoch 77 MSE: 0.0001649100158829242
Epoch 78 MSE: 0.00016467231034766883
Epoch 79 MSE: 0.0001615305955056101
Epoch 80 MSE: 0.00015122946933843195
Epoch 81 MSE: 0.00014862215903121978
Epoch 82 MSE: 0.00015189674741122872
Epoch 83 MSE: 0.00014921993715688586
Epoch 84 MSE: 0.00014545302838087082
Epoch 85 MSE: 0.00014611586811952293
Epoch 86 MSE: 0.0001436998718418181
Epoch 87 MSE: 0.0001373736304230988
Epoch 88 MSE: 0.00013497019244823605
Epoch 89 MSE: 0.00013471097918227315

Epoch 90 MSE: 0.00013174832565709949
Epoch 91 MSE: 0.0001299875002587214
Epoch 92 MSE: 0.00013042658974882215
Epoch 93 MSE: 0.00012822555436287075
Epoch 94 MSE: 0.00012479684664867818
Epoch 95 MSE: 0.0001234616938745603
Epoch 96 MSE: 0.00012173905997769907
Epoch 97 MSE: 0.00011908904707524925
Epoch 98 MSE: 0.00011818335769930854
Epoch 99 MSE: 0.00011765429371735081
T-time: 6.383364677429199

=====
Train Score: 0.32 RMSE
=====
Validation Score: 8.19 RMSE
=====

Epoch 0 MSE: 0.050460334867239
Epoch 1 MSE: 0.034989189356565475
Epoch 2 MSE: 0.03429438918828964
Epoch 3 MSE: 0.036887023597955704
Epoch 4 MSE: 0.031412530690431595
Epoch 5 MSE: 0.02801433764398098
Epoch 6 MSE: 0.027321910485625267
Epoch 7 MSE: 0.02666962891817093
Epoch 8 MSE: 0.02450587972998619
Epoch 9 MSE: 0.021284103393554688
Epoch 10 MSE: 0.018562329933047295
Epoch 11 MSE: 0.01683441549539566
Epoch 12 MSE: 0.01416365709155798
Epoch 13 MSE: 0.009257834404706955
Epoch 14 MSE: 0.004895031917840242
Epoch 15 MSE: 0.0029262336902320385
Epoch 16 MSE: 0.0010456073796376586
Epoch 17 MSE: 0.0009483190951868892
Epoch 18 MSE: 0.003917243797332048
Epoch 19 MSE: 0.004556581843644381
Epoch 20 MSE: 0.0035910664591938257
Epoch 21 MSE: 0.0035663496237248182
Epoch 22 MSE: 0.0034997796174138784
Epoch 23 MSE: 0.0024122430477291346
Epoch 24 MSE: 0.0011986178578808904
Epoch 25 MSE: 0.001135561615228653
Epoch 26 MSE: 0.0019516005413606763
Epoch 27 MSE: 0.002214355394244194
Epoch 28 MSE: 0.0018354705534875393
Epoch 29 MSE: 0.0017153358785435557

Epoch	30	MSE:	0.001696425606496632
Epoch	31	MSE:	0.0014146118192002177
Epoch	32	MSE:	0.0008848285069689155
Epoch	33	MSE:	0.00043343991274014115
Epoch	34	MSE:	0.00038442673394456506
Epoch	35	MSE:	0.0005921105039305985
Epoch	36	MSE:	0.000621135113760829
Epoch	37	MSE:	0.0005092602223157883
Epoch	38	MSE:	0.0005341938813216984
Epoch	39	MSE:	0.0006227849517017603
Epoch	40	MSE:	0.0005495246150530875
Epoch	41	MSE:	0.0003231549635529518
Epoch	42	MSE:	0.00025645323330536485
Epoch	43	MSE:	0.0004494673339650035
Epoch	44	MSE:	0.0003939242160413414
Epoch	45	MSE:	0.0002906789886765182
Epoch	46	MSE:	0.0003943337651435286
Epoch	47	MSE:	0.0004366450593806803
Epoch	48	MSE:	0.00028882711194455624
Epoch	49	MSE:	0.0002082519931718707
Epoch	50	MSE:	0.0002672694390639663
Epoch	51	MSE:	0.00022971096041146666
Epoch	52	MSE:	0.00015256273036357015
Epoch	53	MSE:	0.00020900399249512702
Epoch	54	MSE:	0.00024668010883033276
Epoch	55	MSE:	0.00017789358389563859
Epoch	56	MSE:	0.0001605092838872224
Epoch	57	MSE:	0.000188265839824453
Epoch	58	MSE:	0.00014340148482006043
Epoch	59	MSE:	0.0001142652181442827
Epoch	60	MSE:	0.00014968926552683115
Epoch	61	MSE:	0.00015214669110719115
Epoch	62	MSE:	0.00012469736975617707
Epoch	63	MSE:	0.0001360001479042694
Epoch	64	MSE:	0.00014313826977740973
Epoch	65	MSE:	0.00011233491386519745
Epoch	66	MSE:	0.0001047121622832492
Epoch	67	MSE:	0.00011744906078092754
Epoch	68	MSE:	0.0001057047993526794
Epoch	69	MSE:	9.938331641023979e-05
Epoch	70	MSE:	0.00011348073167027906
Epoch	71	MSE:	0.000107124142232351
Epoch	72	MSE:	9.44488201639615e-05
Epoch	73	MSE:	9.92643617792055e-05
Epoch	74	MSE:	9.552595292916521e-05
Epoch	75	MSE:	8.591597725171596e-05
Epoch	76	MSE:	9.111232793657109e-05
Epoch	77	MSE:	9.317320655100048e-05

```

Epoch 78 MSE: 8.627490751678124e-05
Epoch 79 MSE: 8.732575224712491e-05
Epoch 80 MSE: 8.750258712098002e-05
Epoch 81 MSE: 8.019447705009952e-05
Epoch 82 MSE: 7.918904884718359e-05
Epoch 83 MSE: 8.059088577283546e-05
Epoch 84 MSE: 7.640779949724674e-05
Epoch 85 MSE: 7.597217336297035e-05
Epoch 86 MSE: 7.682231080252677e-05
Epoch 87 MSE: 7.258504047058523e-05
Epoch 88 MSE: 7.064503006404266e-05
Epoch 89 MSE: 7.031787390587851e-05
Epoch 90 MSE: 6.693327304674312e-05
Epoch 91 MSE: 6.578551256097853e-05
Epoch 92 MSE: 6.586966628674418e-05
Epoch 93 MSE: 6.328550080070272e-05
Epoch 94 MSE: 6.195896276040003e-05
Epoch 95 MSE: 6.118913734098896e-05
Epoch 96 MSE: 5.850343222846277e-05
Epoch 97 MSE: 5.7181550801033154e-05
Epoch 98 MSE: 5.637286085402593e-05
Epoch 99 MSE: 5.433464684756473e-05
T-time: 6.971682548522949

```

```

=====
Train Score: 0.22 RMSE
=====
Validation Score: 2.29 RMSE
=====

```

```

=====
Time Step = 20 | Hidden States = 32 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.04924992099404335
Epoch 1 MSE: 0.03935188427567482
Epoch 2 MSE: 0.040303975343704224
Epoch 3 MSE: 0.02297935076057911
Epoch 4 MSE: 0.0220342930406332
Epoch 5 MSE: 0.01913538947701454
Epoch 6 MSE: 0.008324443362653255
Epoch 7 MSE: 0.013593225739896297
Epoch 8 MSE: 0.003648148151114583
Epoch 9 MSE: 0.005610182415693998
Epoch 10 MSE: 0.00474493857473135
Epoch 11 MSE: 0.0020236377604305744
Epoch 12 MSE: 0.005057177972048521
Epoch 13 MSE: 0.0004919097991660237

```

Epoch	14	MSE:	0.001032938715070486
Epoch	15	MSE:	0.002619341015815735
Epoch	16	MSE:	0.0018473200034350157
Epoch	17	MSE:	0.0008685515495017171
Epoch	18	MSE:	0.0012045282637700438
Epoch	19	MSE:	0.0018448535120114684
Epoch	20	MSE:	0.0014675254933536053
Epoch	21	MSE:	0.0004653270880226046
Epoch	22	MSE:	0.00016472175775561482
Epoch	23	MSE:	0.000709800748154521
Epoch	24	MSE:	0.0008908883901312947
Epoch	25	MSE:	0.00039707613177597523
Epoch	26	MSE:	0.0002698904136195779
Epoch	27	MSE:	0.0006667573470622301
Epoch	28	MSE:	0.0006764447316527367
Epoch	29	MSE:	0.0002343765809200704
Epoch	30	MSE:	4.825955693377182e-05
Epoch	31	MSE:	0.00025158311473205686
Epoch	32	MSE:	0.0003951620892621577
Epoch	33	MSE:	0.00028188308351673186
Epoch	34	MSE:	0.0001508542336523533
Epoch	35	MSE:	0.0001981045788852498
Epoch	36	MSE:	0.0003015433612745255
Epoch	37	MSE:	0.00025916521553881466
Epoch	38	MSE:	0.00010487875260878354
Epoch	39	MSE:	4.048720438731834e-05
Epoch	40	MSE:	0.00011774903396144509
Epoch	41	MSE:	0.00017496838700026274
Epoch	42	MSE:	0.00012146389781264588
Epoch	43	MSE:	7.166325667640194e-05
Epoch	44	MSE:	0.00010918559564743191
Epoch	45	MSE:	0.00014233472757041454
Epoch	46	MSE:	9.408405458088964e-05
Epoch	47	MSE:	3.635873144958168e-05
Epoch	48	MSE:	4.732000161311589e-05
Epoch	49	MSE:	8.677388541400433e-05
Epoch	50	MSE:	8.54036770761013e-05
Epoch	51	MSE:	5.6753891840344295e-05
Epoch	52	MSE:	5.340957795851864e-05
Epoch	53	MSE:	7.24944329704158e-05
Epoch	54	MSE:	7.024288788670674e-05
Epoch	55	MSE:	4.296838233130984e-05
Epoch	56	MSE:	3.101639958913438e-05
Epoch	57	MSE:	4.664146763388999e-05
Epoch	58	MSE:	5.6818938901415095e-05
Epoch	59	MSE:	4.585751594277099e-05
Epoch	60	MSE:	3.8029407733120024e-05
Epoch	61	MSE:	4.550362064037472e-05

```

Epoch 62 MSE: 4.811938924831338e-05
Epoch 63 MSE: 3.680462759803049e-05
Epoch 64 MSE: 2.9802171411574818e-05
Epoch 65 MSE: 3.624373857746832e-05
Epoch 66 MSE: 4.168432133155875e-05
Epoch 67 MSE: 3.727557123056613e-05
Epoch 68 MSE: 3.3145439374493435e-05
Epoch 69 MSE: 3.590529377106577e-05
Epoch 70 MSE: 3.7283294659573585e-05
Epoch 71 MSE: 3.241445301682688e-05
Epoch 72 MSE: 2.9241886295494623e-05
Epoch 73 MSE: 3.229409776395187e-05
Epoch 74 MSE: 3.4605363907758147e-05
Epoch 75 MSE: 3.221450970158912e-05
Epoch 76 MSE: 3.057930007344112e-05
Epoch 77 MSE: 3.207412373740226e-05
Epoch 78 MSE: 3.204312815796584e-05
Epoch 79 MSE: 2.9541310141212307e-05
Epoch 80 MSE: 2.896751175285317e-05
Epoch 81 MSE: 3.072859180974774e-05
Epoch 82 MSE: 3.1001869501778856e-05
Epoch 83 MSE: 2.9598399123642594e-05
Epoch 84 MSE: 2.9389968403847888e-05
Epoch 85 MSE: 3.0049000997678377e-05
Epoch 86 MSE: 2.9412749427137896e-05
Epoch 87 MSE: 2.8373455279506743e-05
Epoch 88 MSE: 2.8746499083354138e-05
Epoch 89 MSE: 2.9423608793877065e-05
Epoch 90 MSE: 2.8964299417566508e-05
Epoch 91 MSE: 2.842502908606548e-05
Epoch 92 MSE: 2.8664655474130996e-05
Epoch 93 MSE: 2.8654159905272536e-05
Epoch 94 MSE: 2.8076836315449327e-05
Epoch 95 MSE: 2.7970267183263786e-05
Epoch 96 MSE: 2.8341697543510236e-05
Epoch 97 MSE: 2.8267773814150132e-05
Epoch 98 MSE: 2.7898326152353548e-05
Epoch 99 MSE: 2.7893829610547982e-05
T-time: 6.775812149047852

```

```

=====
Train Score: 0.16 RMSE
=====
Validation Score: 3.24 RMSE
=====

```

```

Epoch 0 MSE: 0.04200812801718712
Epoch 1 MSE: 0.041303642094135284

```


Epoch 2 MSE: 0.032244350761175156
Epoch 3 MSE: 0.03061683289706707
Epoch 4 MSE: 0.029338615015149117
Epoch 5 MSE: 0.024828260764479637
Epoch 6 MSE: 0.022728214040398598
Epoch 7 MSE: 0.02093980461359024
Epoch 8 MSE: 0.01639198698103428
Epoch 9 MSE: 0.012856408953666687
Epoch 10 MSE: 0.01098731067031622
Epoch 11 MSE: 0.00614006444811821
Epoch 12 MSE: 0.0027352492325007915
Epoch 13 MSE: 0.0012241005897521973
Epoch 14 MSE: 0.0013187754666432738
Epoch 15 MSE: 0.004542363807559013
Epoch 16 MSE: 0.004638268146663904
Epoch 17 MSE: 0.002477741800248623
Epoch 18 MSE: 0.00070976372808218
Epoch 19 MSE: 0.0005057586822658777
Epoch 20 MSE: 0.0009146146476268768
Epoch 21 MSE: 0.0015810279874131083
Epoch 22 MSE: 0.002143273362889886
Epoch 23 MSE: 0.002165901707485318
Epoch 24 MSE: 0.0017459222581237555
Epoch 25 MSE: 0.0011546985479071736
Epoch 26 MSE: 0.000647310575004667
Epoch 27 MSE: 0.0003062535251956433
Epoch 28 MSE: 0.00023943002452142537
Epoch 29 MSE: 0.0005018288502469659
Epoch 30 MSE: 0.0008268079254776239
Epoch 31 MSE: 0.0009180511115118861
Epoch 32 MSE: 0.0007044993690215051
Epoch 33 MSE: 0.0004274067177902907
Epoch 34 MSE: 0.0002833798062056303
Epoch 35 MSE: 0.00017133541405200958
Epoch 36 MSE: 0.00022647541482001543
Epoch 37 MSE: 0.0003847816842608154
Epoch 38 MSE: 0.00044236532994545996
Epoch 39 MSE: 0.00041256501572206616
Epoch 40 MSE: 0.0003714552440214902
Epoch 41 MSE: 0.0002732824650593102
Epoch 42 MSE: 0.00014390099386218935
Epoch 43 MSE: 0.00010680349805625156
Epoch 44 MSE: 0.0001355912972940132
Epoch 45 MSE: 0.00016271173080895096
Epoch 46 MSE: 0.0002129539498127997
Epoch 47 MSE: 0.00021494909015018493
Epoch 48 MSE: 0.00014768137771170586
Epoch 49 MSE: 0.00010209988977294415

Epoch 50 MSE: 7.439241016982123e-05
Epoch 51 MSE: 6.566826050402597e-05
Epoch 52 MSE: 9.892202069750056e-05
Epoch 53 MSE: 0.0001225466694450006
Epoch 54 MSE: 0.00011759264452848583
Epoch 55 MSE: 0.00010707147885113955
Epoch 56 MSE: 7.957035268191248e-05
Epoch 57 MSE: 5.19972454640083e-05
Epoch 58 MSE: 5.325765232555568e-05
Epoch 59 MSE: 6.144004873931408e-05
Epoch 60 MSE: 7.186339644249529e-05
Epoch 61 MSE: 8.068101305980235e-05
Epoch 62 MSE: 6.738259980920702e-05
Epoch 63 MSE: 5.317795876180753e-05
Epoch 64 MSE: 4.486439866013825e-05
Epoch 65 MSE: 4.06379513151478e-05
Epoch 66 MSE: 4.912765507469885e-05
Epoch 67 MSE: 5.444547423394397e-05
Epoch 68 MSE: 5.312324356054887e-05
Epoch 69 MSE: 4.961947342962958e-05
Epoch 70 MSE: 4.0186936530517414e-05
Epoch 71 MSE: 3.578089672373608e-05
Epoch 72 MSE: 3.6929264751961455e-05
Epoch 73 MSE: 3.872512388625182e-05
Epoch 74 MSE: 4.241391798132099e-05
Epoch 75 MSE: 4.025400266982615e-05
Epoch 76 MSE: 3.61915044777561e-05
Epoch 77 MSE: 3.3015909139066935e-05
Epoch 78 MSE: 3.085485514020547e-05
Epoch 79 MSE: 3.2885076507227495e-05
Epoch 80 MSE: 3.387661854503676e-05
Epoch 81 MSE: 3.395384919713251e-05
Epoch 82 MSE: 3.2461048249388114e-05
Epoch 83 MSE: 2.951495480374433e-05
Epoch 84 MSE: 2.8619238946703263e-05
Epoch 85 MSE: 2.8258085876586847e-05
Epoch 86 MSE: 2.9207138140918687e-05
Epoch 87 MSE: 2.9435073884087615e-05
Epoch 88 MSE: 2.834838960552588e-05
Epoch 89 MSE: 2.7178419259143993e-05
Epoch 90 MSE: 2.578320163593162e-05
Epoch 91 MSE: 2.5805304176174104e-05
Epoch 92 MSE: 2.589634823380038e-05
Epoch 93 MSE: 2.601892083475832e-05
Epoch 94 MSE: 2.5525980163365602e-05
Epoch 95 MSE: 2.452164153510239e-05
Epoch 96 MSE: 2.3915854399092495e-05
Epoch 97 MSE: 2.347132067370694e-05

Epoch 98 MSE: 2.3647633497603238e-05
Epoch 99 MSE: 2.3491549654863775e-05
T-time: 7.229863882064819

=====
Train Score: 0.14 RMSE
=====
Validation Score: 1.80 RMSE
=====

=====
Time Step = 20 | Hidden States = 32 | Num Layers = 2
=====

Epoch 0 MSE: 0.056970253586769104
Epoch 1 MSE: 0.1911926120519638
Epoch 2 MSE: 0.03376320004463196
Epoch 3 MSE: 0.05331186205148697
Epoch 4 MSE: 0.05366164818406105
Epoch 5 MSE: 0.03524738550186157
Epoch 6 MSE: 0.026686394587159157
Epoch 7 MSE: 0.036526598036289215
Epoch 8 MSE: 0.03493746370077133
Epoch 9 MSE: 0.023316720500588417
Epoch 10 MSE: 0.019105277955532074
Epoch 11 MSE: 0.02097022905945778
Epoch 12 MSE: 0.0199042409658432
Epoch 13 MSE: 0.012191840447485447
Epoch 14 MSE: 0.0045249005779623985
Epoch 15 MSE: 0.00877147726714611
Epoch 16 MSE: 0.00432552769780159
Epoch 17 MSE: 0.004425468388944864
Epoch 18 MSE: 0.008806100115180016
Epoch 19 MSE: 0.002310869749635458
Epoch 20 MSE: 0.0013006668305024505
Epoch 21 MSE: 0.0030225254595279694
Epoch 22 MSE: 0.0021974050905555487
Epoch 23 MSE: 0.0013384524499997497
Epoch 24 MSE: 0.0019242720445618033
Epoch 25 MSE: 0.0027942671440541744
Epoch 26 MSE: 0.002754766959697008
Epoch 27 MSE: 0.0018096350831910968
Epoch 28 MSE: 0.0008815072942525148
Epoch 29 MSE: 0.0007469786214642227
Epoch 30 MSE: 0.0010597031796351075
Epoch 31 MSE: 0.000892339798156172
Epoch 32 MSE: 0.00039781330269761384
Epoch 33 MSE: 0.00048282466013915837

Epoch 34 MSE: 0.001029693754389882
 Epoch 35 MSE: 0.0011278789024800062
 Epoch 36 MSE: 0.0006542145856656134
 Epoch 37 MSE: 0.00031448554364033043
 Epoch 38 MSE: 0.00039737633778713644
 Epoch 39 MSE: 0.0004858626634813845
 Epoch 40 MSE: 0.00034067235537804663
 Epoch 41 MSE: 0.00022168623399920762
 Epoch 42 MSE: 0.00032317914883606136
 Epoch 43 MSE: 0.0004888514522463083
 Epoch 44 MSE: 0.0004947244888171554
 Epoch 45 MSE: 0.00034220388624817133
 Epoch 46 MSE: 0.00021591942640952766
 Epoch 47 MSE: 0.00022111267026048154
 Epoch 48 MSE: 0.00025528506375849247
 Epoch 49 MSE: 0.00020205069449730217
 Epoch 50 MSE: 0.0001330822124145925
 Epoch 51 MSE: 0.0001653981307754293
 Epoch 52 MSE: 0.00024675531312823296
 Epoch 53 MSE: 0.00024908603518269956
 Epoch 54 MSE: 0.00017622682207729667
 Epoch 55 MSE: 0.00013453704013954848
 Epoch 56 MSE: 0.00015027205517981201
 Epoch 57 MSE: 0.00015270814765244722
 Epoch 58 MSE: 0.0001196306839119643
 Epoch 59 MSE: 0.00010620835382724181
 Epoch 60 MSE: 0.0001340700255241245
 Epoch 61 MSE: 0.00015705334953963757
 Epoch 62 MSE: 0.00014121457934379578
 Epoch 63 MSE: 0.000112436871859245
 Epoch 64 MSE: 0.00010648910392774269
 Epoch 65 MSE: 0.0001131597236962989
 Epoch 66 MSE: 0.00010456813470227644
 Epoch 67 MSE: 8.9433575340081e-05
 Epoch 68 MSE: 9.313509508501738e-05
 Epoch 69 MSE: 0.0001078492496162653
 Epoch 70 MSE: 0.0001076403641491197
 Epoch 71 MSE: 9.39735837164335e-05
 Epoch 72 MSE: 8.782622899161652e-05
 Epoch 73 MSE: 9.061737364390865e-05
 Epoch 74 MSE: 8.773257286520675e-05
 Epoch 75 MSE: 8.004865958355367e-05
 Epoch 76 MSE: 8.0097459431272e-05
 Epoch 77 MSE: 8.632185199530795e-05
 Epoch 78 MSE: 8.673310367157683e-05
 Epoch 79 MSE: 8.063855057116598e-05
 Epoch 80 MSE: 7.733948586974293e-05
 Epoch 81 MSE: 7.81349663157016e-05

Epoch 82 MSE: 7.639620889676735e-05
Epoch 83 MSE: 7.239690603455529e-05
Epoch 84 MSE: 7.219724648166448e-05
Epoch 85 MSE: 7.47850863263011e-05
Epoch 86 MSE: 7.426457887049764e-05
Epoch 87 MSE: 7.111026934580877e-05
Epoch 88 MSE: 6.985195796005428e-05
Epoch 89 MSE: 6.990742986090481e-05
Epoch 90 MSE: 6.824899173807353e-05
Epoch 91 MSE: 6.633659359067678e-05
Epoch 92 MSE: 6.662202213192359e-05
Epoch 93 MSE: 6.730416498612612e-05
Epoch 94 MSE: 6.616158498218283e-05
Epoch 95 MSE: 6.461789598688483e-05
Epoch 96 MSE: 6.420546560548246e-05
Epoch 97 MSE: 6.368995673255995e-05
Epoch 98 MSE: 6.23539017396979e-05
Epoch 99 MSE: 6.16145262029022e-05
T-time: 15.115833759307861

=====
Train Score: 0.23 RMSE
=====
Validation Score: 6.11 RMSE
=====

Epoch 0 MSE: 0.08024495095014572
Epoch 1 MSE: 0.03558538109064102
Epoch 2 MSE: 0.0503331758081913
Epoch 3 MSE: 0.04169435054063797
Epoch 4 MSE: 0.03350633382797241
Epoch 5 MSE: 0.031117025762796402
Epoch 6 MSE: 0.031270455569028854
Epoch 7 MSE: 0.03104744292795658
Epoch 8 MSE: 0.029027357697486877
Epoch 9 MSE: 0.02533632703125477
Epoch 10 MSE: 0.021798761561512947
Epoch 11 MSE: 0.02015637420117855
Epoch 12 MSE: 0.0201789028942585
Epoch 13 MSE: 0.014230762608349323
Epoch 14 MSE: 0.008676717057824135
Epoch 15 MSE: 0.006079191341996193
Epoch 16 MSE: 0.003683346090838313
Epoch 17 MSE: 0.0006208492559380829
Epoch 18 MSE: 0.004154627211391926
Epoch 19 MSE: 0.004882219713181257
Epoch 20 MSE: 0.002827702322974801
Epoch 21 MSE: 0.003504342632368207

Epoch	22	MSE:	0.0034184579271823168
Epoch	23	MSE:	0.0017453309847041965
Epoch	24	MSE:	0.0005337395123206079
Epoch	25	MSE:	0.0013181816320866346
Epoch	26	MSE:	0.002431813394650817
Epoch	27	MSE:	0.002032879274338484
Epoch	28	MSE:	0.0012406788300722837
Epoch	29	MSE:	0.001183325075544417
Epoch	30	MSE:	0.0014736357843503356
Epoch	31	MSE:	0.0013759627472609282
Epoch	32	MSE:	0.0007443660870194435
Epoch	33	MSE:	0.00014996422396507114
Epoch	34	MSE:	0.00028573846793733537
Epoch	35	MSE:	0.0007765700574964285
Epoch	36	MSE:	0.000618414138443768
Epoch	37	MSE:	0.00021101327729411423
Epoch	38	MSE:	0.0002916563826147467
Epoch	39	MSE:	0.0005375298205763102
Epoch	40	MSE:	0.0004483023367356509
Epoch	41	MSE:	0.00012213132868055254
Epoch	42	MSE:	0.0001581912365509197
Epoch	43	MSE:	0.00046684592962265015
Epoch	44	MSE:	0.00022419630840886384
Epoch	45	MSE:	8.901473484002054e-05
Epoch	46	MSE:	0.00025506390375085175
Epoch	47	MSE:	0.0002659439924173057
Epoch	48	MSE:	0.00010108391870744526
Epoch	49	MSE:	5.79161242058035e-05
Epoch	50	MSE:	0.00018963411275763065
Epoch	51	MSE:	0.0001914934255182743
Epoch	52	MSE:	6.727626896463335e-05
Epoch	53	MSE:	6.736813520547003e-05
Epoch	54	MSE:	0.0001427126699127257
Epoch	55	MSE:	0.0001256572868442163
Epoch	56	MSE:	4.880207052337937e-05
Epoch	57	MSE:	5.5134787544375286e-05
Epoch	58	MSE:	0.00011268393427599221
Epoch	59	MSE:	9.053738176589832e-05
Epoch	60	MSE:	4.051646828884259e-05
Epoch	61	MSE:	5.857679934706539e-05
Epoch	62	MSE:	8.658769365865737e-05
Epoch	63	MSE:	6.191692227730528e-05
Epoch	64	MSE:	3.3862317650346085e-05
Epoch	65	MSE:	5.3126677812542766e-05
Epoch	66	MSE:	6.932936230441555e-05
Epoch	67	MSE:	4.5448698074324057e-05
Epoch	68	MSE:	3.396104875719175e-05
Epoch	69	MSE:	5.025982318329625e-05

```

Epoch 70 MSE: 5.2327803132357076e-05
Epoch 71 MSE: 3.4172127925558016e-05
Epoch 72 MSE: 3.1567116820951924e-05
Epoch 73 MSE: 4.456937676877715e-05
Epoch 74 MSE: 3.967718657804653e-05
Epoch 75 MSE: 2.7792331820819527e-05
Epoch 76 MSE: 3.262158497818746e-05
Epoch 77 MSE: 3.765518340514973e-05
Epoch 78 MSE: 2.936461714853067e-05
Epoch 79 MSE: 2.48701217060443e-05
Epoch 80 MSE: 3.105514406342991e-05
Epoch 81 MSE: 3.0276685720309615e-05
Epoch 82 MSE: 2.3680069716647267e-05
Epoch 83 MSE: 2.5393228497705422e-05
Epoch 84 MSE: 2.8241129257366993e-05
Epoch 85 MSE: 2.3966947992448695e-05
Epoch 86 MSE: 2.1963602193864062e-05
Epoch 87 MSE: 2.5264771466027014e-05
Epoch 88 MSE: 2.4164741262211464e-05
Epoch 89 MSE: 2.1144418496987782e-05
Epoch 90 MSE: 2.2795939003117383e-05
Epoch 91 MSE: 2.3507613150286488e-05
Epoch 92 MSE: 2.094406409014482e-05
Epoch 93 MSE: 2.10711732506752e-05
Epoch 94 MSE: 2.2501160856336355e-05
Epoch 95 MSE: 2.1023724912083708e-05
Epoch 96 MSE: 2.0319546820246615e-05
Epoch 97 MSE: 2.1516820197575726e-05
Epoch 98 MSE: 2.0886549464194104e-05
Epoch 99 MSE: 1.986884126381483e-05
T-time: 15.113189697265625

```

```

=====
Train Score: 0.13 RMSE
=====
Validation Score: 0.83 RMSE
=====

```

```

=====
Time Step = 30 | Hidden States = 2 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.31168508529663086
Epoch 1 MSE: 0.27456560730934143
Epoch 2 MSE: 0.24024991691112518
Epoch 3 MSE: 0.20876213908195496
Epoch 4 MSE: 0.18007436394691467
Epoch 5 MSE: 0.15411125123500824

```

Epoch 6 MSE: 0.13075850903987885
Epoch 7 MSE: 0.10987623780965805
Epoch 8 MSE: 0.09131525456905365
Epoch 9 MSE: 0.07493362575769424
Epoch 10 MSE: 0.06060963496565819
Epoch 11 MSE: 0.04824777692556381
Epoch 12 MSE: 0.03777685761451721
Epoch 13 MSE: 0.029141167178750038
Epoch 14 MSE: 0.02228713035583496
Epoch 15 MSE: 0.01714821718633175
Epoch 16 MSE: 0.013630237430334091
Epoch 17 MSE: 0.011598894372582436
Epoch 18 MSE: 0.010870971716940403
Epoch 19 MSE: 0.011211185716092587
Epoch 20 MSE: 0.01233710814267397
Epoch 21 MSE: 0.013934272341430187
Epoch 22 MSE: 0.015681486576795578
Epoch 23 MSE: 0.017282895743846893
Epoch 24 MSE: 0.018499862402677536
Epoch 25 MSE: 0.019174590706825256
Epoch 26 MSE: 0.019239777699112892
Epoch 27 MSE: 0.018713122233748436
Epoch 28 MSE: 0.017680007964372635
Epoch 29 MSE: 0.0162697434425354
Epoch 30 MSE: 0.014630894176661968
Epoch 31 MSE: 0.012909626588225365
Epoch 32 MSE: 0.011233431287109852
Epoch 33 MSE: 0.00970096793025732
Epoch 34 MSE: 0.008377757854759693
Epoch 35 MSE: 0.007296719588339329
Epoch 36 MSE: 0.006462176330387592
Epoch 37 MSE: 0.005855931434780359
Epoch 38 MSE: 0.005444129463285208
Epoch 39 MSE: 0.0051839472725987434
Epoch 40 MSE: 0.005029417108744383
Epoch 41 MSE: 0.004936083219945431
Epoch 42 MSE: 0.004864392336457968
Epoch 43 MSE: 0.004781894385814667
Epoch 44 MSE: 0.004664415493607521
Epoch 45 MSE: 0.004496401641517878
Epoch 46 MSE: 0.00427062576636672
Epoch 47 MSE: 0.003987395204603672
Epoch 48 MSE: 0.0036534196697175503
Epoch 49 MSE: 0.0032804158981889486
Epoch 50 MSE: 0.002883554669097066
Epoch 51 MSE: 0.002479822840541601
Epoch 52 MSE: 0.0020863921381533146
Epoch 53 MSE: 0.001719071064144373

Epoch 54 MSE: 0.0013909544795751572
 Epoch 55 MSE: 0.0011113676009699702
 Epoch 56 MSE: 0.0008851917809806764
 Epoch 57 MSE: 0.0007126688142307103
 Epoch 58 MSE: 0.0005896961665712297
 Epoch 59 MSE: 0.0005086007295176387
 Epoch 60 MSE: 0.00045930681517347693
 Epoch 61 MSE: 0.000430730520747602
 Epoch 62 MSE: 0.0004122164682485163
 Epoch 63 MSE: 0.00039480888517573476
 Epoch 64 MSE: 0.00037216063356027007
 Epoch 65 MSE: 0.00034097599564120173
 Epoch 66 MSE: 0.0003009497304446995
 Epoch 67 MSE: 0.0002542562724556774
 Epoch 68 MSE: 0.00020473428594414145
 Epoch 69 MSE: 0.0001569174783071503
 Epoch 70 MSE: 0.00011511743650771677
 Epoch 71 MSE: 8.267835801234469e-05
 Epoch 72 MSE: 6.151025445433334e-05
 Epoch 73 MSE: 5.192918251850642e-05
 Epoch 74 MSE: 5.2779818361159414e-05
 Epoch 75 MSE: 6.177167233545333e-05
 Epoch 76 MSE: 7.594375347252935e-05
 Epoch 77 MSE: 9.216120088240132e-05
 Epoch 78 MSE: 0.00010756459960248321
 Epoch 79 MSE: 0.00011991443170700222
 Epoch 80 MSE: 0.0001277897390536964
 Epoch 81 MSE: 0.00013064574159216136
 Epoch 82 MSE: 0.00012873536616098136
 Epoch 83 MSE: 0.0001229317713296041
 Epoch 84 MSE: 0.00011449122393969446
 Epoch 85 MSE: 0.00010479826596565545
 Epoch 86 MSE: 9.51367401285097e-05
 Epoch 87 MSE: 8.65132751641795e-05
 Epoch 88 MSE: 7.955395267345011e-05
 Epoch 89 MSE: 7.447881944244727e-05
 Epoch 90 MSE: 7.114611798897386e-05
 Epoch 91 MSE: 6.914885307196528e-05
 Epoch 92 MSE: 6.793917418690398e-05
 Epoch 93 MSE: 6.695430784020573e-05
 Epoch 94 MSE: 6.572438724106178e-05
 Epoch 95 MSE: 6.394410593202338e-05
 Epoch 96 MSE: 6.150191620690748e-05
 Epoch 97 MSE: 5.8470290241530165e-05
 Epoch 98 MSE: 5.5061984312487766e-05
 Epoch 99 MSE: 5.1569331844802946e-05
 T-time: 3.420062780380249

```
=====
Train Score: 0.21 RMSE
=====
Validation Score: 7.22 RMSE
=====
```

```
Epoch 0 MSE: 0.38266265392303467
Epoch 1 MSE: 0.35195863246917725
Epoch 2 MSE: 0.32383808493614197
Epoch 3 MSE: 0.2980961501598358
Epoch 4 MSE: 0.27448973059654236
Epoch 5 MSE: 0.2528187036514282
Epoch 6 MSE: 0.23289845883846283
Epoch 7 MSE: 0.214585542678833
Epoch 8 MSE: 0.19774752855300903
Epoch 9 MSE: 0.18226271867752075
Epoch 10 MSE: 0.16802451014518738
Epoch 11 MSE: 0.15493610501289368
Epoch 12 MSE: 0.14290781319141388
Epoch 13 MSE: 0.13185574114322662
Epoch 14 MSE: 0.12170173972845078
Epoch 15 MSE: 0.11248093098402023
Epoch 16 MSE: 0.10680723935365677
Epoch 17 MSE: 0.10182614624500275
Epoch 18 MSE: 0.0972568616271019
Epoch 19 MSE: 0.09299106150865555
Epoch 20 MSE: 0.08897912502288818
Epoch 21 MSE: 0.08518989384174347
Epoch 22 MSE: 0.08159173280000687
Epoch 23 MSE: 0.07815733551979065
Epoch 24 MSE: 0.07487098127603531
Epoch 25 MSE: 0.07171671837568283
Epoch 26 MSE: 0.06868162751197815
Epoch 27 MSE: 0.06575493514537811
Epoch 28 MSE: 0.06292213499546051
Epoch 29 MSE: 0.06016519293189049
Epoch 30 MSE: 0.057471033185720444
Epoch 31 MSE: 0.0548233799636364
Epoch 32 MSE: 0.05220571905374527
Epoch 33 MSE: 0.049608826637268066
Epoch 34 MSE: 0.0470266155898571
Epoch 35 MSE: 0.044452082365751266
Epoch 36 MSE: 0.0418827086687088
Epoch 37 MSE: 0.03932345286011696
Epoch 38 MSE: 0.036787234246730804
Epoch 39 MSE: 0.03429880738258362
Epoch 40 MSE: 0.031914498656988144
Epoch 41 MSE: 0.02969176694750786
```

Epoch	42	MSE:	0.028321411460638046
Epoch	43	MSE:	0.02701745741069317
Epoch	44	MSE:	0.025081971660256386
Epoch	45	MSE:	0.022660011425614357
Epoch	46	MSE:	0.02073844149708748
Epoch	47	MSE:	0.019181950017809868
Epoch	48	MSE:	0.017726240679621696
Epoch	49	MSE:	0.016349611803889275
Epoch	50	MSE:	0.015055852942168713
Epoch	51	MSE:	0.013854077085852623
Epoch	52	MSE:	0.012753374874591827
Epoch	53	MSE:	0.011765990406274796
Epoch	54	MSE:	0.010899057611823082
Epoch	55	MSE:	0.010146597400307655
Epoch	56	MSE:	0.009485355578362942
Epoch	57	MSE:	0.008878380991518497
Epoch	58	MSE:	0.008289773017168045
Epoch	59	MSE:	0.0077028656378388405
Epoch	60	MSE:	0.007125951815396547
Epoch	61	MSE:	0.006581561174243689
Epoch	62	MSE:	0.0060911462642252445
Epoch	63	MSE:	0.005662973970174789
Epoch	64	MSE:	0.005290942266583443
Epoch	65	MSE:	0.004959005396813154
Epoch	66	MSE:	0.004648585803806782
Epoch	67	MSE:	0.004345317836850882
Epoch	68	MSE:	0.004042737185955048
Epoch	69	MSE:	0.003742291359230876
Epoch	70	MSE:	0.0034504481591284275
Epoch	71	MSE:	0.003176299622282386
Epoch	72	MSE:	0.0029254057444632053
Epoch	73	MSE:	0.002700744429603219
Epoch	74	MSE:	0.002497768262401223
Epoch	75	MSE:	0.002307020127773285
Epoch	76	MSE:	0.00211971253156662
Epoch	77	MSE:	0.001932691317051649
Epoch	78	MSE:	0.001750380964949727
Epoch	79	MSE:	0.0015790832694619894
Epoch	80	MSE:	0.001422844361513853
Epoch	81	MSE:	0.0012830429477617145
Epoch	82	MSE:	0.0011580577120184898
Epoch	83	MSE:	0.0010448535904288292
Epoch	84	MSE:	0.0009409801568835974
Epoch	85	MSE:	0.0008450758177787066
Epoch	86	MSE:	0.0007574601913802326
Epoch	87	MSE:	0.0006799767725169659
Epoch	88	MSE:	0.0006137228338047862
Epoch	89	MSE:	0.0005636896821670234

Epoch 90 MSE: 0.0005563280428759754
Epoch 91 MSE: 0.0005457653314806521
Epoch 92 MSE: 0.0005026151775382459
Epoch 93 MSE: 0.0004431274428498
Epoch 94 MSE: 0.00039602129254490137
Epoch 95 MSE: 0.00037403954775072634
Epoch 96 MSE: 0.000359276426024735
Epoch 97 MSE: 0.00033499120036140084
Epoch 98 MSE: 0.00030119094299152493
Epoch 99 MSE: 0.0002657509467098862
T-time: 3.6822509765625

=====
Train Score: 0.49 RMSE
=====

Validation Score: 1.16 RMSE
=====

=====
Time Step = 30 | Hidden States = 2 | Num Layers = 2
=====

Epoch 0 MSE: 0.3222784698009491
Epoch 1 MSE: 0.27903011441230774
Epoch 2 MSE: 0.2403552383184433
Epoch 3 MSE: 0.20586763322353363
Epoch 4 MSE: 0.17493769526481628
Epoch 5 MSE: 0.14693357050418854
Epoch 6 MSE: 0.12152116000652313
Epoch 7 MSE: 0.0986960232257843
Epoch 8 MSE: 0.07864818722009659
Epoch 9 MSE: 0.06164006143808365
Epoch 10 MSE: 0.047922611236572266
Epoch 11 MSE: 0.03766923397779465
Epoch 12 MSE: 0.03091660514473915
Epoch 13 MSE: 0.027512596920132637
Epoch 14 MSE: 0.027078993618488312
Epoch 15 MSE: 0.029002685099840164
Epoch 16 MSE: 0.032473087310791016
Epoch 17 MSE: 0.036580394953489304
Epoch 18 MSE: 0.04046371951699257
Epoch 19 MSE: 0.043457671999931335
Epoch 20 MSE: 0.045175403356552124
Epoch 21 MSE: 0.045508697628974915
Epoch 22 MSE: 0.04457128420472145
Epoch 23 MSE: 0.042622800916433334
Epoch 24 MSE: 0.03999623656272888
Epoch 25 MSE: 0.03703851252794266

Epoch	26	MSE:	0.03406589478254318
Epoch	27	MSE:	0.03133401274681091
Epoch	28	MSE:	0.02902158722281456
Epoch	29	MSE:	0.027226630598306656
Epoch	30	MSE:	0.02597273513674736
Epoch	31	MSE:	0.02522278018295765
Epoch	32	MSE:	0.02489646151661873
Epoch	33	MSE:	0.024888429790735245
Epoch	34	MSE:	0.025084668770432472
Epoch	35	MSE:	0.025375591591000557
Epoch	36	MSE:	0.025665320456027985
Epoch	37	MSE:	0.02587750181555748
Epoch	38	MSE:	0.025957979261875153
Epoch	39	MSE:	0.02587508223950863
Epoch	40	MSE:	0.025618206709623337
Epoch	41	MSE:	0.02519499510526657
Epoch	42	MSE:	0.02462778426706791
Epoch	43	MSE:	0.02394939959049225
Epoch	44	MSE:	0.023198718205094337
Epoch	45	MSE:	0.02241622842848301
Epoch	46	MSE:	0.021639754995703697
Epoch	47	MSE:	0.020900791510939598
Epoch	48	MSE:	0.02022155374288559
Epoch	49	MSE:	0.01961315982043743
Epoch	50	MSE:	0.019075099378824234
Epoch	51	MSE:	0.018596109002828598
Epoch	52	MSE:	0.018156398087739944
Epoch	53	MSE:	0.01773100718855858
Epoch	54	MSE:	0.017293816432356834
Epoch	55	MSE:	0.016821658238768578
Epoch	56	MSE:	0.01629786379635334
Epoch	57	MSE:	0.01571468450129032
Epoch	58	MSE:	0.015074198134243488
Epoch	59	MSE:	0.014387557283043861
Epoch	60	MSE:	0.013672742061316967
Epoch	61	MSE:	0.012951231561601162
Epoch	62	MSE:	0.012244228273630142
Epoch	63	MSE:	0.011569015681743622
Epoch	64	MSE:	0.010936169885098934
Epoch	65	MSE:	0.010348048061132431
Epoch	66	MSE:	0.00979889277368784
Epoch	67	MSE:	0.009276563301682472
Epoch	68	MSE:	0.00876565370708704
Epoch	69	MSE:	0.008251437917351723
Epoch	70	MSE:	0.007723853457719088
Epoch	71	MSE:	0.007180573884397745
Epoch	72	MSE:	0.006628320552408695
Epoch	73	MSE:	0.006081819999963045

```

Epoch 74 MSE: 0.005560470279306173
Epoch 75 MSE: 0.005083424970507622
Epoch 76 MSE: 0.004664478357881308
Epoch 77 MSE: 0.00430850638076663
Epoch 78 MSE: 0.004010898061096668
Epoch 79 MSE: 0.0037604928947985172
Epoch 80 MSE: 0.0035450102295726538
Epoch 81 MSE: 0.0033566260244697332
Epoch 82 MSE: 0.0031949032563716173
Epoch 83 MSE: 0.0030653178691864014
Epoch 84 MSE: 0.002973916009068489
Epoch 85 MSE: 0.002921041799709201
Epoch 86 MSE: 0.0028981263749301434
Epoch 87 MSE: 0.002889992669224739
Epoch 88 MSE: 0.0028815821278840303
Epoch 89 MSE: 0.002864730777218938
Epoch 90 MSE: 0.0028403496835380793
Epoch 91 MSE: 0.0028147203847765923
Epoch 92 MSE: 0.0027929143980145454
Epoch 93 MSE: 0.002774246269837022
Epoch 94 MSE: 0.002752674510702491
Epoch 95 MSE: 0.002721215831115842
Epoch 96 MSE: 0.0026766755618155003
Epoch 97 MSE: 0.002621361520141363
Epoch 98 MSE: 0.002561075845733285
Epoch 99 MSE: 0.0025013568811118603
T-time: 5.778496265411377

```

```

=====
Train Score: 1.49 RMSE
=====
Validation Score: 18.77 RMSE
=====

```

```

Epoch 0 MSE: 0.29807865619659424
Epoch 1 MSE: 0.2621855139732361
Epoch 2 MSE: 0.22666998207569122
Epoch 3 MSE: 0.1917477548122406
Epoch 4 MSE: 0.15778708457946777
Epoch 5 MSE: 0.12516888976097107
Epoch 6 MSE: 0.09433102607727051
Epoch 7 MSE: 0.06483282148838043
Epoch 8 MSE: 0.038022931665182114
Epoch 9 MSE: 0.01695605181157589
Epoch 10 MSE: 0.0038654657546430826
Epoch 11 MSE: 0.0014090311015024781
Epoch 12 MSE: 0.010699622333049774
Epoch 13 MSE: 0.02510492503643036

```

Epoch	14	MSE:	0.03396249935030937
Epoch	15	MSE:	0.03449345752596855
Epoch	16	MSE:	0.02924114465713501
Epoch	17	MSE:	0.02175324410200119
Epoch	18	MSE:	0.014597320929169655
Epoch	19	MSE:	0.009082449600100517
Epoch	20	MSE:	0.005619177594780922
Epoch	21	MSE:	0.004042669665068388
Epoch	22	MSE:	0.003924746997654438
Epoch	23	MSE:	0.004770132713019848
Epoch	24	MSE:	0.006106595043092966
Epoch	25	MSE:	0.0075356061570346355
Epoch	26	MSE:	0.008718141354620457
Epoch	27	MSE:	0.009523543529212475
Epoch	28	MSE:	0.00991413090378046
Epoch	29	MSE:	0.009899788536131382
Epoch	30	MSE:	0.009527312591671944
Epoch	31	MSE:	0.00887078233063221
Epoch	32	MSE:	0.008020643144845963
Epoch	33	MSE:	0.007074045483022928
Epoch	34	MSE:	0.006125086452811956
Epoch	35	MSE:	0.005255918949842453
Epoch	36	MSE:	0.004528750199824572
Epoch	37	MSE:	0.0039809877052903175
Epoch	38	MSE:	0.0036219561006873846
Epoch	39	MSE:	0.003434533253312111
Epoch	40	MSE:	0.0033784417901188135
Epoch	41	MSE:	0.003396890824660659
Epoch	42	MSE:	0.003428007010370493
Epoch	43	MSE:	0.0034260039683431387
Epoch	44	MSE:	0.0033759367652237415
Epoch	45	MSE:	0.003223852952942252
Epoch	46	MSE:	0.0029371106065809727
Epoch	47	MSE:	0.00253877486102283
Epoch	48	MSE:	0.0020860289223492146
Epoch	49	MSE:	0.0016460136976093054
Epoch	50	MSE:	0.0012737471843138337
Epoch	51	MSE:	0.0009994221618399024
Epoch	52	MSE:	0.0008198163122870028
Epoch	53	MSE:	0.0007138070068322122
Epoch	54	MSE:	0.0006567599484696984
Epoch	55	MSE:	0.0006231250590644777
Epoch	56	MSE:	0.0005906839505769312
Epoch	57	MSE:	0.0005439228261820972
Epoch	58	MSE:	0.0004761815071105957
Epoch	59	MSE:	0.00038952138856984675
Epoch	60	MSE:	0.0002923642750829458
Epoch	61	MSE:	0.00019859152962453663

Epoch 62 MSE: 0.00012451084330677986
Epoch 63 MSE: 8.275578875327483e-05
Epoch 64 MSE: 7.819325401214883e-05
Epoch 65 MSE: 0.00010471040150150657
Epoch 66 MSE: 0.00014806599938310683
Epoch 67 MSE: 0.00019106242689304054
Epoch 68 MSE: 0.0002193786931456998
Epoch 69 MSE: 0.00022601902310270816
Epoch 70 MSE: 0.00021255889441818
Epoch 71 MSE: 0.00018712293240241706
Epoch 72 MSE: 0.00016022348427213728
Epoch 73 MSE: 0.0001404605427524075
Epoch 74 MSE: 0.0001317220157943666
Epoch 75 MSE: 0.00013277714606374502
Epoch 76 MSE: 0.0001387267402606085
Epoch 77 MSE: 0.00014355946041177958
Epoch 78 MSE: 0.0001425677037332207
Epoch 79 MSE: 0.00013385291094891727
Epoch 80 MSE: 0.00011859599908348173
Epoch 81 MSE: 0.00010020648187492043
Epoch 82 MSE: 8.283080387627706e-05
Epoch 83 MSE: 6.983943603700027e-05
Epoch 84 MSE: 6.279120862018317e-05
Epoch 85 MSE: 6.118803139543161e-05
Epoch 86 MSE: 6.297955405898392e-05
Epoch 87 MSE: 6.554340507136658e-05
Epoch 88 MSE: 6.671592564089224e-05
Epoch 89 MSE: 6.547228986164555e-05
Epoch 90 MSE: 6.207778642419726e-05
Epoch 91 MSE: 5.771922951680608e-05
Epoch 92 MSE: 5.3848372772336006e-05
Epoch 93 MSE: 5.156659972271882e-05
Epoch 94 MSE: 5.124495510244742e-05
Epoch 95 MSE: 5.249131208984181e-05
Epoch 96 MSE: 5.441350003820844e-05
Epoch 97 MSE: 5.602049714070745e-05
Epoch 98 MSE: 5.659730959450826e-05
Epoch 99 MSE: 5.591701847151853e-05
T-time: 4.957951784133911

=====
Train Score: 0.22 RMSE
=====
Validation Score: 1.17 RMSE
=====

=====
Time Step = 30 | Hidden States = 4 | Num Layers = 1

=====

Epoch 0 MSE: 0.13149809837341309
Epoch 1 MSE: 0.09963641315698624
Epoch 2 MSE: 0.07917803525924683
Epoch 3 MSE: 0.06763906031847
Epoch 4 MSE: 0.06233752518892288
Epoch 5 MSE: 0.060646362602710724
Epoch 6 MSE: 0.06032881140708923
Epoch 7 MSE: 0.05985136330127716
Epoch 8 MSE: 0.05847601220011711
Epoch 9 MSE: 0.05610226094722748
Epoch 10 MSE: 0.05300470441579819
Epoch 11 MSE: 0.04960326850414276
Epoch 12 MSE: 0.046310488134622574
Epoch 13 MSE: 0.04344494640827179
Epoch 14 MSE: 0.041190262883901596
Epoch 15 MSE: 0.03958602249622345
Epoch 16 MSE: 0.03854375705122948
Epoch 17 MSE: 0.03788324072957039
Epoch 18 MSE: 0.03738231584429741
Epoch 19 MSE: 0.03682979568839073
Epoch 20 MSE: 0.03606904670596123
Epoch 21 MSE: 0.03502277657389641
Epoch 22 MSE: 0.033695802092552185
Epoch 23 MSE: 0.032159674912691116
Epoch 24 MSE: 0.03052624501287937
Epoch 25 MSE: 0.028917407616972923
Epoch 26 MSE: 0.02743644267320633
Epoch 27 MSE: 0.026145176962018013
Epoch 28 MSE: 0.0250510573387146
Epoch 29 MSE: 0.024107785895466805
Epoch 30 MSE: 0.02323133498430252
Epoch 31 MSE: 0.022327976301312447
Epoch 32 MSE: 0.021324992179870605
Epoch 33 MSE: 0.02019250951707363
Epoch 34 MSE: 0.01894904486835003
Epoch 35 MSE: 0.017650648951530457
Epoch 36 MSE: 0.016369014978408813
Epoch 37 MSE: 0.015166203491389751
Epoch 38 MSE: 0.014073378406465054
Epoch 39 MSE: 0.013080161064863205
Epoch 40 MSE: 0.01213916763663292
Epoch 41 MSE: 0.011186265386641026
Epoch 42 MSE: 0.010170145891606808
Epoch 43 MSE: 0.009077813476324081
Epoch 44 MSE: 0.007942619733512402
Epoch 45 MSE: 0.006829829886555672

Epoch	46	MSE:	0.005806009750813246
Epoch	47	MSE:	0.004906513728201389
Epoch	48	MSE:	0.0041190627962350845
Epoch	49	MSE:	0.00339686032384634
Epoch	50	MSE:	0.0026967518497258425
Epoch	51	MSE:	0.0020161443389952183
Epoch	52	MSE:	0.0014002036768943071
Epoch	53	MSE:	0.0009124029893428087
Epoch	54	MSE:	0.0005871688481420279
Epoch	55	MSE:	0.00040012667886912823
Epoch	56	MSE:	0.00028797617414966226
Epoch	57	MSE:	0.00020772349671460688
Epoch	58	MSE:	0.00017331948038190603
Epoch	59	MSE:	0.0002252475533168763
Epoch	60	MSE:	0.0003657652996480465
Epoch	61	MSE:	0.0005359567585401237
Epoch	62	MSE:	0.0006666507106274366
Epoch	63	MSE:	0.000741573516279459
Epoch	64	MSE:	0.0007934779278002679
Epoch	65	MSE:	0.0008445589919574559
Epoch	66	MSE:	0.0008724444778636098
Epoch	67	MSE:	0.0008436392527073622
Epoch	68	MSE:	0.0007614509086124599
Epoch	69	MSE:	0.0006621888023801148
Epoch	70	MSE:	0.0005736087332479656
Epoch	71	MSE:	0.0004932694137096405
Epoch	72	MSE:	0.0004070967552252114
Epoch	73	MSE:	0.0003161117492709309
Epoch	74	MSE:	0.00023742156918160617
Epoch	75	MSE:	0.00018452087533660233
Epoch	76	MSE:	0.00015452044317498803
Epoch	77	MSE:	0.0001352223043795675
Epoch	78	MSE:	0.00011968657054239884
Epoch	79	MSE:	0.0001107272255467251
Epoch	80	MSE:	0.0001132416509790346
Epoch	81	MSE:	0.000125873411889188
Epoch	82	MSE:	0.00014131008356343955
Epoch	83	MSE:	0.0001531489979242906
Epoch	84	MSE:	0.00016069984121713787
Epoch	85	MSE:	0.00016710047202650458
Epoch	86	MSE:	0.00017412242596037686
Epoch	87	MSE:	0.00017981835117097944
Epoch	88	MSE:	0.0001809683453757316
Epoch	89	MSE:	0.000176792309503071
Epoch	90	MSE:	0.0001696201943559572
Epoch	91	MSE:	0.00016222351405303925
Epoch	92	MSE:	0.00015522027388215065
Epoch	93	MSE:	0.00014736891898792237

Epoch 94 MSE: 0.00013793096877634525
Epoch 95 MSE: 0.00012806215090677142
Epoch 96 MSE: 0.0001197316450998187
Epoch 97 MSE: 0.00011374369205441326
Epoch 98 MSE: 0.00010929525888059288
Epoch 99 MSE: 0.00010537834896240383
T-time: 3.1757357120513916

=====

Train Score: 0.31 RMSE

=====

Validation Score: 10.04 RMSE

=====

Epoch 0 MSE: 0.11873690038919449
Epoch 1 MSE: 0.10858886688947678
Epoch 2 MSE: 0.09937623888254166
Epoch 3 MSE: 0.09090328961610794
Epoch 4 MSE: 0.0831817016005516
Epoch 5 MSE: 0.07625410705804825
Epoch 6 MSE: 0.07018733769655228
Epoch 7 MSE: 0.06499002128839493
Epoch 8 MSE: 0.06072250381112099
Epoch 9 MSE: 0.05742676928639412
Epoch 10 MSE: 0.055086709558963776
Epoch 11 MSE: 0.05356884002685547
Epoch 12 MSE: 0.052618417888879776
Epoch 13 MSE: 0.05197449028491974
Epoch 14 MSE: 0.05144820734858513
Epoch 15 MSE: 0.050918083637952805
Epoch 16 MSE: 0.05031367763876915
Epoch 17 MSE: 0.04960484802722931
Epoch 18 MSE: 0.048792384564876556
Epoch 19 MSE: 0.047898441553115845
Epoch 20 MSE: 0.04695729538798332
Epoch 21 MSE: 0.04600735381245613
Epoch 22 MSE: 0.0450848750770092
Epoch 23 MSE: 0.04421991854906082
Epoch 24 MSE: 0.04343396797776222
Epoch 25 MSE: 0.04273933917284012
Epoch 26 MSE: 0.04213965684175491
Epoch 27 MSE: 0.041631218045949936
Epoch 28 MSE: 0.0412047803401947
Epoch 29 MSE: 0.04084744676947594
Epoch 30 MSE: 0.04054456576704979
Epoch 31 MSE: 0.0402812622487545
Epoch 32 MSE: 0.04004376381635666
Epoch 33 MSE: 0.03982028365135193

Epoch	34	MSE:	0.039601586759090424
Epoch	35	MSE:	0.039381176233291626
Epoch	36	MSE:	0.03915528208017349
Epoch	37	MSE:	0.038922544568777084
Epoch	38	MSE:	0.03868364915251732
Epoch	39	MSE:	0.0384407564997673
Epoch	40	MSE:	0.03819701448082924
Epoch	41	MSE:	0.03795596957206726
Epoch	42	MSE:	0.03772113099694252
Epoch	43	MSE:	0.037495557218790054
Epoch	44	MSE:	0.037281546741724014
Epoch	45	MSE:	0.037080444395542145
Epoch	46	MSE:	0.0368926003575325
Epoch	47	MSE:	0.03671739250421524
Epoch	48	MSE:	0.03655340149998665
Epoch	49	MSE:	0.036398570984601974
Epoch	50	MSE:	0.036250531673431396
Epoch	51	MSE:	0.03610682114958763
Epoch	52	MSE:	0.035965170711278915
Epoch	53	MSE:	0.03582365810871124
Epoch	54	MSE:	0.0356808602809906
Epoch	55	MSE:	0.035535916686058044
Epoch	56	MSE:	0.03538847714662552
Epoch	57	MSE:	0.03523862361907959
Epoch	58	MSE:	0.035086750984191895
Epoch	59	MSE:	0.034933432936668396
Epoch	60	MSE:	0.034779250621795654
Epoch	61	MSE:	0.034624673426151276
Epoch	62	MSE:	0.03447001799941063
Epoch	63	MSE:	0.034315325319767
Epoch	64	MSE:	0.03416040539741516
Epoch	65	MSE:	0.034004829823970795
Epoch	66	MSE:	0.03384801372885704
Epoch	67	MSE:	0.033689238131046295
Epoch	68	MSE:	0.033527739346027374
Epoch	69	MSE:	0.03336276859045029
Epoch	70	MSE:	0.03319362923502922
Epoch	71	MSE:	0.03301972895860672
Epoch	72	MSE:	0.03284057602286339
Epoch	73	MSE:	0.03265577182173729
Epoch	74	MSE:	0.03246500343084335
Epoch	75	MSE:	0.03226802125573158
Epoch	76	MSE:	0.03206457942724228
Epoch	77	MSE:	0.03185443952679634
Epoch	78	MSE:	0.031637296080589294
Epoch	79	MSE:	0.031412817537784576
Epoch	80	MSE:	0.031180566176772118
Epoch	81	MSE:	0.030940059572458267

```

Epoch 82 MSE: 0.030690722167491913
Epoch 83 MSE: 0.030431929975748062
Epoch 84 MSE: 0.03016301989555359
Epoch 85 MSE: 0.029883306473493576
Epoch 86 MSE: 0.029592081904411316
Epoch 87 MSE: 0.02928866073489189
Epoch 88 MSE: 0.028972331434488297
Epoch 89 MSE: 0.02864241600036621
Epoch 90 MSE: 0.028298210352659225
Epoch 91 MSE: 0.02793900854885578
Epoch 92 MSE: 0.02756408601999283
Epoch 93 MSE: 0.027172671630978584
Epoch 94 MSE: 0.026763955131173134
Epoch 95 MSE: 0.02633707970380783
Epoch 96 MSE: 0.0258918646723032
Epoch 97 MSE: 0.02543424256145954
Epoch 98 MSE: 0.024980008602142334
Epoch 99 MSE: 0.02451673522591591
T-time: 5.6565210819244385

```

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=====
```

```
Train Score: 4.67 RMSE
```

```
=====
```

```
Validation Score: 29.59 RMSE
```

```
=====
```

```
=====
```

```
Time Step = 30 | Hidden States = 4 | Num Layers = 2
```

```
=====
```

```

Epoch 0 MSE: 0.1433069258928299
Epoch 1 MSE: 0.07710074633359909
Epoch 2 MSE: 0.03168284147977829
Epoch 3 MSE: 0.011016794480383396
Epoch 4 MSE: 0.013518337160348892
Epoch 5 MSE: 0.027552442625164986
Epoch 6 MSE: 0.03760810196399689
Epoch 7 MSE: 0.03800003603100777
Epoch 8 MSE: 0.031048117205500603
Epoch 9 MSE: 0.021237678825855255
Epoch 10 MSE: 0.012513917870819569
Epoch 11 MSE: 0.007222149055451155
Epoch 12 MSE: 0.005839816760271788
Epoch 13 MSE: 0.007369123864918947
Epoch 14 MSE: 0.010126856155693531
Epoch 15 MSE: 0.012504811398684978
Epoch 16 MSE: 0.01344325952231884
Epoch 17 MSE: 0.01258918922394514

```

Epoch	18	MSE:	0.010225184261798859
Epoch	19	MSE:	0.007069110870361328
Epoch	20	MSE:	0.004012463614344597
Epoch	21	MSE:	0.0018395651131868362
Epoch	22	MSE:	0.0009781125700101256
Epoch	23	MSE:	0.0013598032528534532
Epoch	24	MSE:	0.0024685324169695377
Epoch	25	MSE:	0.0035818249452859163
Epoch	26	MSE:	0.00409723212942481
Epoch	27	MSE:	0.003775843186303973
Epoch	28	MSE:	0.002791648032143712
Epoch	29	MSE:	0.0015939167933538556
Epoch	30	MSE:	0.0006733298650942743
Epoch	31	MSE:	0.0003412370278965682
Epoch	32	MSE:	0.0006110130925662816
Epoch	33	MSE:	0.0012260433286428452
Epoch	34	MSE:	0.0018124519847333431
Epoch	35	MSE:	0.0020706462673842907
Epoch	36	MSE:	0.0019035818986594677
Epoch	37	MSE:	0.001426788279786706
Epoch	38	MSE:	0.0008766322862356901
Epoch	39	MSE:	0.0004796137218363583
Epoch	40	MSE:	0.00035028046113438904
Epoch	41	MSE:	0.0004595018399413675
Epoch	42	MSE:	0.0006754745845682919
Epoch	43	MSE:	0.0008453124319203198
Epoch	44	MSE:	0.0008710527908988297
Epoch	45	MSE:	0.0007450501434504986
Epoch	46	MSE:	0.000535993545781821
Epoch	47	MSE:	0.00034196823253296316
Epoch	48	MSE:	0.0002388173743383959
Epoch	49	MSE:	0.00024860765552148223
Epoch	50	MSE:	0.0003388607583474368
Epoch	51	MSE:	0.00044704886386170983
Epoch	52	MSE:	0.000514366605784744
Epoch	53	MSE:	0.0005117342225275934
Epoch	54	MSE:	0.00044774371781386435
Epoch	55	MSE:	0.00035813706927001476
Epoch	56	MSE:	0.00028453851700760424
Epoch	57	MSE:	0.0002537255350034684
Epoch	58	MSE:	0.0002670037210918963
Epoch	59	MSE:	0.0003034995752386749
Epoch	60	MSE:	0.000334063806803897
Epoch	61	MSE:	0.0003375121741555631
Epoch	62	MSE:	0.00031056065927259624
Epoch	63	MSE:	0.000267021416220814
Epoch	64	MSE:	0.00022805813932791352
Epoch	65	MSE:	0.0002098264085361734

```

Epoch 66 MSE: 0.00021550175733864307
Epoch 67 MSE: 0.00023543024144601077
Epoch 68 MSE: 0.00025424352497793734
Epoch 69 MSE: 0.0002600757288746536
Epoch 70 MSE: 0.00025048962561413646
Epoch 71 MSE: 0.00023224885808303952
Epoch 72 MSE: 0.00021593795099761337
Epoch 73 MSE: 0.00020922330440953374
Epoch 74 MSE: 0.0002128445339621976
Epoch 75 MSE: 0.00022128272394184023
Epoch 76 MSE: 0.00022703740978613496
Epoch 77 MSE: 0.000225432391744107
Epoch 78 MSE: 0.00021698637283407152
Epoch 79 MSE: 0.00020628444326575845
Epoch 80 MSE: 0.00019857953884638846
Epoch 81 MSE: 0.0001965377014130354
Epoch 82 MSE: 0.00019908057583961636
Epoch 83 MSE: 0.00020268662774469703
Epoch 84 MSE: 0.00020395225146785378
Epoch 85 MSE: 0.00020163961744401604
Epoch 86 MSE: 0.00019704220176208764
Epoch 87 MSE: 0.00019271770725026727
Epoch 88 MSE: 0.0001906429388327524
Epoch 89 MSE: 0.00019104013335891068
Epoch 90 MSE: 0.00019250874174758792
Epoch 91 MSE: 0.00019318082195241004
Epoch 92 MSE: 0.0001919993810588494
Epoch 93 MSE: 0.00018927373457700014
Epoch 94 MSE: 0.00018626217206474394
Epoch 95 MSE: 0.0001842003402998671
Epoch 96 MSE: 0.0001834999566199258
Epoch 97 MSE: 0.00018362217815592885
Epoch 98 MSE: 0.00018360187823418528
Epoch 99 MSE: 0.0001827716187108308
T-time: 5.70621919631958

```

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=====
```

```
Train Score: 0.40 RMSE
```

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=====
```

```
Validation Score: 10.15 RMSE
```

```
=====
```

```

Epoch 0 MSE: 0.2550153434276581
Epoch 1 MSE: 0.2095935195684433
Epoch 2 MSE: 0.170844167470932
Epoch 3 MSE: 0.1393737643957138
Epoch 4 MSE: 0.11254601925611496
Epoch 5 MSE: 0.0898924171924591

```

Epoch 6 MSE: 0.07097331434488297
Epoch 7 MSE: 0.05539015308022499
Epoch 8 MSE: 0.04275066405534744
Epoch 9 MSE: 0.03266792371869087
Epoch 10 MSE: 0.02477172389626503
Epoch 11 MSE: 0.018667301163077354
Epoch 12 MSE: 0.013977711088955402
Epoch 13 MSE: 0.010358172468841076
Epoch 14 MSE: 0.007532702758908272
Epoch 15 MSE: 0.005553756840527058
Epoch 16 MSE: 0.0035986308939754963
Epoch 17 MSE: 0.0018780081300064921
Epoch 18 MSE: 0.000937403179705143
Epoch 19 MSE: 0.0009102059993892908
Epoch 20 MSE: 0.0012762368423864245
Epoch 21 MSE: 0.0013515419559553266
Epoch 22 MSE: 0.0012593321735039353
Epoch 23 MSE: 0.0013216034276410937
Epoch 24 MSE: 0.00163002940826118
Epoch 25 MSE: 0.002029021503403783
Epoch 26 MSE: 0.00222956296056509
Epoch 27 MSE: 0.002087288536131382
Epoch 28 MSE: 0.001662412192672491
Epoch 29 MSE: 0.0011413426836952567
Epoch 30 MSE: 0.0007166664581745863
Epoch 31 MSE: 0.0004806744691450149
Epoch 32 MSE: 0.000422908051405102
Epoch 33 MSE: 0.00042321704677306116
Epoch 34 MSE: 0.0003457537095528096
Epoch 35 MSE: 0.00022183200053405017
Epoch 36 MSE: 0.00016717638936825097
Epoch 37 MSE: 0.00023439853976015002
Epoch 38 MSE: 0.0003736783692147583
Epoch 39 MSE: 0.0004896096070297062
Epoch 40 MSE: 0.0005194160039536655
Epoch 41 MSE: 0.00047045497922226787
Epoch 42 MSE: 0.00039894875953905284
Epoch 43 MSE: 0.0003574597940314561
Epoch 44 MSE: 0.00035678298445418477
Epoch 45 MSE: 0.000355272350134328
Epoch 46 MSE: 0.00029513085610233247
Epoch 47 MSE: 0.0001957939239218831
Epoch 48 MSE: 0.0001252049405593425
Epoch 49 MSE: 0.00011203618487343192
Epoch 50 MSE: 0.00012416235404089093
Epoch 51 MSE: 0.00012031127698719501
Epoch 52 MSE: 9.378666436532512e-05
Epoch 53 MSE: 7.35119974706322e-05

Epoch 54 MSE: 8.690168033353984e-05
Epoch 55 MSE: 0.00011929378524655476
Epoch 56 MSE: 0.0001306927006226033
Epoch 57 MSE: 0.00011186304618604481
Epoch 58 MSE: 9.151174162980169e-05
Epoch 59 MSE: 8.86170964804478e-05
Epoch 60 MSE: 9.012355440063402e-05
Epoch 61 MSE: 7.634704525116831e-05
Epoch 62 MSE: 5.048369348514825e-05
Epoch 63 MSE: 3.3187105145771056e-05
Epoch 64 MSE: 3.369911064510234e-05
Epoch 65 MSE: 3.836713221971877e-05
Epoch 66 MSE: 3.345196819282137e-05
Epoch 67 MSE: 2.6569994588498957e-05
Epoch 68 MSE: 2.993333873746451e-05
Epoch 69 MSE: 3.881896554958075e-05
Epoch 70 MSE: 4.098139106645249e-05
Epoch 71 MSE: 3.5258035495644435e-05
Epoch 72 MSE: 3.088611993007362e-05
Epoch 73 MSE: 3.1783034501131624e-05
Epoch 74 MSE: 3.1303174182539806e-05
Epoch 75 MSE: 2.528998811612837e-05
Epoch 76 MSE: 1.933266503328923e-05
Epoch 77 MSE: 1.8383265341981314e-05
Epoch 78 MSE: 1.9732107830350287e-05
Epoch 79 MSE: 1.9055913071497343e-05
Epoch 80 MSE: 1.7288009985350072e-05
Epoch 81 MSE: 1.7916228898684494e-05
Epoch 82 MSE: 2.0527491869870573e-05
Epoch 83 MSE: 2.157505150535144e-05
Epoch 84 MSE: 2.0308820239733905e-05
Epoch 85 MSE: 1.931704355229158e-05
Epoch 86 MSE: 1.962594069482293e-05
Epoch 87 MSE: 1.9425924620009027e-05
Epoch 88 MSE: 1.7771411876310594e-05
Epoch 89 MSE: 1.627782876312267e-05
Epoch 90 MSE: 1.6229510947596282e-05
Epoch 91 MSE: 1.662608156038914e-05
Epoch 92 MSE: 1.631325540074613e-05
Epoch 93 MSE: 1.595057619852014e-05
Epoch 94 MSE: 1.6422534827142954e-05
Epoch 95 MSE: 1.7093665519496426e-05
Epoch 96 MSE: 1.7026130080921575e-05
Epoch 97 MSE: 1.657261782384012e-05
Epoch 98 MSE: 1.6495509044034407e-05
Epoch 99 MSE: 1.6553076420677826e-05
T-time: 5.240422248840332

```
=====
Train Score: 0.12 RMSE
=====
Validation Score: 5.88 RMSE
=====
```

```
=====
Time Step = 30 | Hidden States = 8 | Num Layers = 1
=====
```

```
Epoch 0 MSE: 0.05278213694691658
Epoch 1 MSE: 0.03361978754401207
Epoch 2 MSE: 0.02731967158615589
Epoch 3 MSE: 0.031066661700606346
Epoch 4 MSE: 0.030981848016381264
Epoch 5 MSE: 0.026058509945869446
Epoch 6 MSE: 0.02095559425652027
Epoch 7 MSE: 0.018112970516085625
Epoch 8 MSE: 0.017298994585871696
Epoch 9 MSE: 0.017008569091558456
Epoch 10 MSE: 0.01577960141003132
Epoch 11 MSE: 0.013044299557805061
Epoch 12 MSE: 0.009370028041303158
Epoch 13 MSE: 0.006152652204036713
Epoch 14 MSE: 0.0047519453801214695
Epoch 15 MSE: 0.004772848449647427
Epoch 16 MSE: 0.0037172678858041763
Epoch 17 MSE: 0.0011691413819789886
Epoch 18 MSE: 0.000393932219594717
Epoch 19 MSE: 0.0026690575759857893
Epoch 20 MSE: 0.003409460885450244
Epoch 21 MSE: 0.0021971629466861486
Epoch 22 MSE: 0.00276157446205616
Epoch 23 MSE: 0.003334128763526678
Epoch 24 MSE: 0.0019008215749636292
Epoch 25 MSE: 0.0007423684583045542
Epoch 26 MSE: 0.0007273777737282217
Epoch 27 MSE: 0.000835050770547241
Epoch 28 MSE: 0.0005690010730177164
Epoch 29 MSE: 0.00029128804453648627
Epoch 30 MSE: 0.000369840330677107
Epoch 31 MSE: 0.0007153096958063543
Epoch 32 MSE: 0.0009738623048178852
Epoch 33 MSE: 0.0009548494126647711
Epoch 34 MSE: 0.0007753787795081735
Epoch 35 MSE: 0.0006506607169285417
Epoch 36 MSE: 0.0006474862457253039
Epoch 37 MSE: 0.0006541337352246046
```

Epoch	38	MSE:	0.000543351867236197
Epoch	39	MSE:	0.00032901408849284053
Epoch	40	MSE:	0.00015351128240581602
Epoch	41	MSE:	0.00012415357923600823
Epoch	42	MSE:	0.0001862193166743964
Epoch	43	MSE:	0.00020434979523997754
Epoch	44	MSE:	0.00015486370830330998
Epoch	45	MSE:	0.00014183342864271253
Epoch	46	MSE:	0.00021460371499415487
Epoch	47	MSE:	0.0002848793810699135
Epoch	48	MSE:	0.0002654272539075464
Epoch	49	MSE:	0.00019356803386472166
Epoch	50	MSE:	0.00015622872160747647
Epoch	51	MSE:	0.00015905538748484105
Epoch	52	MSE:	0.00014278202434070408
Epoch	53	MSE:	9.306035644840449e-05
Epoch	54	MSE:	5.772589793195948e-05
Epoch	55	MSE:	6.662660598522052e-05
Epoch	56	MSE:	9.344331192551181e-05
Epoch	57	MSE:	0.000101790064945817
Epoch	58	MSE:	9.250688162865117e-05
Epoch	59	MSE:	9.052677341969684e-05
Epoch	60	MSE:	0.00010294208186678588
Epoch	61	MSE:	0.0001103850154322572
Epoch	62	MSE:	9.82069832389243e-05
Epoch	63	MSE:	7.755197293590754e-05
Epoch	64	MSE:	6.719017255818471e-05
Epoch	65	MSE:	6.743230187566951e-05
Epoch	66	MSE:	6.467309867730364e-05
Epoch	67	MSE:	5.52221063117031e-05
Epoch	68	MSE:	5.014980342821218e-05
Epoch	69	MSE:	5.589789725490846e-05
Epoch	70	MSE:	6.359057442750782e-05
Epoch	71	MSE:	6.365303124766797e-05
Epoch	72	MSE:	5.974005762254819e-05
Epoch	73	MSE:	5.959281770628877e-05
Epoch	74	MSE:	6.135851435828954e-05
Epoch	75	MSE:	5.851071546203457e-05
Epoch	76	MSE:	5.1992614316986874e-05
Epoch	77	MSE:	4.830924444831908e-05
Epoch	78	MSE:	4.8854813940124586e-05
Epoch	79	MSE:	4.914290548185818e-05
Epoch	80	MSE:	4.7348767111543566e-05
Epoch	81	MSE:	4.656691089621745e-05
Epoch	82	MSE:	4.838252061745152e-05
Epoch	83	MSE:	5.002191392122768e-05
Epoch	84	MSE:	4.919691491522826e-05
Epoch	85	MSE:	4.746708873426542e-05

```

Epoch 86 MSE: 4.693479058914818e-05
Epoch 87 MSE: 4.679728590417653e-05
Epoch 88 MSE: 4.544924740912393e-05
Epoch 89 MSE: 4.364998312667012e-05
Epoch 90 MSE: 4.310723306844011e-05
Epoch 91 MSE: 4.353961776359938e-05
Epoch 92 MSE: 4.3499658204382285e-05
Epoch 93 MSE: 4.296464248909615e-05
Epoch 94 MSE: 4.2948224290739745e-05
Epoch 95 MSE: 4.334181357990019e-05
Epoch 96 MSE: 4.314526086091064e-05
Epoch 97 MSE: 4.233754953020252e-05
Epoch 98 MSE: 4.177206210442819e-05
Epoch 99 MSE: 4.1587743908166885e-05
T-time: 7.5070459842681885

```

```

=====
Train Score: 0.19 RMSE
=====
Validation Score: 6.44 RMSE
=====

```

```

Epoch 0 MSE: 0.05106747895479202
Epoch 1 MSE: 0.04000783711671829
Epoch 2 MSE: 0.035214584320783615
Epoch 3 MSE: 0.03589357063174248
Epoch 4 MSE: 0.03644981235265732
Epoch 5 MSE: 0.03460550308227539
Epoch 6 MSE: 0.0317227803170681
Epoch 7 MSE: 0.029256943613290787
Epoch 8 MSE: 0.02771889604628086
Epoch 9 MSE: 0.0268555860966444
Epoch 10 MSE: 0.026085566729307175
Epoch 11 MSE: 0.024944549426436424
Epoch 12 MSE: 0.02326631173491478
Epoch 13 MSE: 0.02112613059580326
Epoch 14 MSE: 0.018757790327072144
Epoch 15 MSE: 0.016418617218732834
Epoch 16 MSE: 0.014477932825684547
Epoch 17 MSE: 0.013293270952999592
Epoch 18 MSE: 0.012063956819474697
Epoch 19 MSE: 0.010787257924675941
Epoch 20 MSE: 0.009486738592386246
Epoch 21 MSE: 0.008209380321204662
Epoch 22 MSE: 0.006960908882319927
Epoch 23 MSE: 0.005715483333915472
Epoch 24 MSE: 0.0044549135491251945
Epoch 25 MSE: 0.003249770263209939

```

Epoch	26	MSE:	0.0022121246438473463
Epoch	27	MSE:	0.001395604689605534
Epoch	28	MSE:	0.0007670857012271881
Epoch	29	MSE:	0.0003895141708198935
Epoch	30	MSE:	0.0004035530728287995
Epoch	31	MSE:	0.0006746084545738995
Epoch	32	MSE:	0.0011361748911440372
Epoch	33	MSE:	0.0016898877220228314
Epoch	34	MSE:	0.0019877550657838583
Epoch	35	MSE:	0.0020919612143188715
Epoch	36	MSE:	0.0018833709182217717
Epoch	37	MSE:	0.0015440450515598059
Epoch	38	MSE:	0.0011663420591503382
Epoch	39	MSE:	0.0007990178419277072
Epoch	40	MSE:	0.0005547424079850316
Epoch	41	MSE:	0.00039213517447933555
Epoch	42	MSE:	0.00031762433354742825
Epoch	43	MSE:	0.0003269977169111371
Epoch	44	MSE:	0.00036295183235779405
Epoch	45	MSE:	0.0004217087116558105
Epoch	46	MSE:	0.0004930587019771338
Epoch	47	MSE:	0.0005438716034404933
Epoch	48	MSE:	0.0005761570064350963
Epoch	49	MSE:	0.0005912467604503036
Epoch	50	MSE:	0.0005732380086556077
Epoch	51	MSE:	0.0005289987311698496
Epoch	52	MSE:	0.0004668090841732919
Epoch	53	MSE:	0.000378903845557943
Epoch	54	MSE:	0.00027368892915546894
Epoch	55	MSE:	0.00016877090092748404
Epoch	56	MSE:	8.711807458894327e-05
Epoch	57	MSE:	8.212379907490686e-05
Epoch	58	MSE:	0.0001637105888221413
Epoch	59	MSE:	0.0002212417166447267
Epoch	60	MSE:	0.0001988554431591183
Epoch	61	MSE:	0.00012974548735655844
Epoch	62	MSE:	6.685456173727289e-05
Epoch	63	MSE:	5.038969175075181e-05
Epoch	64	MSE:	6.524207128677517e-05
Epoch	65	MSE:	8.008144504856318e-05
Epoch	66	MSE:	9.334533388027921e-05
Epoch	67	MSE:	0.00010369331721449271
Epoch	68	MSE:	9.841927385423332e-05
Epoch	69	MSE:	8.543949661543593e-05
Epoch	70	MSE:	7.501655636588112e-05
Epoch	71	MSE:	6.141121411928907e-05
Epoch	72	MSE:	4.689349589170888e-05
Epoch	73	MSE:	4.006346716778353e-05

```

Epoch 74 MSE: 3.725471833604388e-05
Epoch 75 MSE: 3.783651482081041e-05
Epoch 76 MSE: 4.4220414565643296e-05
Epoch 77 MSE: 4.5573400711873546e-05
Epoch 78 MSE: 4.3364787416066974e-05
Epoch 79 MSE: 3.624219971243292e-05
Epoch 80 MSE: 2.691508416319266e-05
Epoch 81 MSE: 2.292606768605765e-05
Epoch 82 MSE: 2.1535959604079835e-05
Epoch 83 MSE: 2.3935424906085245e-05
Epoch 84 MSE: 2.7583984774537385e-05
Epoch 85 MSE: 2.920997212640941e-05
Epoch 86 MSE: 3.022539385710843e-05
Epoch 87 MSE: 2.8443455448723398e-05
Epoch 88 MSE: 2.5892655685311183e-05
Epoch 89 MSE: 2.394677903794218e-05
Epoch 90 MSE: 2.2640451788902283e-05
Epoch 91 MSE: 2.366723128943704e-05
Epoch 92 MSE: 2.4835046133375727e-05
Epoch 93 MSE: 2.562371446401812e-05
Epoch 94 MSE: 2.523822695366107e-05
Epoch 95 MSE: 2.3375660020974465e-05
Epoch 96 MSE: 2.19309949898161e-05
Epoch 97 MSE: 2.072254937957041e-05
Epoch 98 MSE: 2.0591982320183888e-05
Epoch 99 MSE: 2.1014366211602464e-05
T-time: 3.923851251602173

```

```

=====
Train Score: 0.14 RMSE
=====
Validation Score: 2.01 RMSE
=====

```

```

=====
Time Step = 30 | Hidden States = 8 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.049527596682310104
Epoch 1 MSE: 0.03605470061302185
Epoch 2 MSE: 0.042219243943691254
Epoch 3 MSE: 0.0339699424803257
Epoch 4 MSE: 0.026178669184446335
Epoch 5 MSE: 0.025176018476486206
Epoch 6 MSE: 0.025676369667053223
Epoch 7 MSE: 0.02168041467666626
Epoch 8 MSE: 0.014866574667394161
Epoch 9 MSE: 0.010453994385898113

```

Epoch	10	MSE:	0.010063659399747849
Epoch	11	MSE:	0.007909794338047504
Epoch	12	MSE:	0.002407744061201811
Epoch	13	MSE:	0.0011232304386794567
Epoch	14	MSE:	0.004829954821616411
Epoch	15	MSE:	0.003660020884126425
Epoch	16	MSE:	0.004582020454108715
Epoch	17	MSE:	0.005983611568808556
Epoch	18	MSE:	0.002934611402451992
Epoch	19	MSE:	0.0017652814276516438
Epoch	20	MSE:	0.0019233215134590864
Epoch	21	MSE:	0.0011201351881027222
Epoch	22	MSE:	0.0004837086598854512
Epoch	23	MSE:	0.0009504971094429493
Epoch	24	MSE:	0.0017617633566260338
Epoch	25	MSE:	0.0019835468847304583
Epoch	26	MSE:	0.0016940936911851168
Epoch	27	MSE:	0.001497879740782082
Epoch	28	MSE:	0.0015820709522813559
Epoch	29	MSE:	0.0015721811214461923
Epoch	30	MSE:	0.0011696434812620282
Epoch	31	MSE:	0.0006228992715477943
Epoch	32	MSE:	0.00039383122930303216
Epoch	33	MSE:	0.0004983940161764622
Epoch	34	MSE:	0.0005307348328642547
Epoch	35	MSE:	0.00038809425313957036
Epoch	36	MSE:	0.00041482914821244776
Epoch	37	MSE:	0.0006704626721329987
Epoch	38	MSE:	0.0007617941009812057
Epoch	39	MSE:	0.0005821087979711592
Epoch	40	MSE:	0.0004467391408979893
Epoch	41	MSE:	0.00044751103268936276
Epoch	42	MSE:	0.000377791584469378
Epoch	43	MSE:	0.00022386199270840734
Epoch	44	MSE:	0.00017497186490800232
Epoch	45	MSE:	0.0002552059886511415
Epoch	46	MSE:	0.0003125865769106895
Epoch	47	MSE:	0.00029254183755256236
Epoch	48	MSE:	0.00028199763619340956
Epoch	49	MSE:	0.00031598805799148977
Epoch	50	MSE:	0.0003185309760738164
Epoch	51	MSE:	0.00025270445621572435
Epoch	52	MSE:	0.00018918384739663452
Epoch	53	MSE:	0.00017986312741413713
Epoch	54	MSE:	0.0001806614745873958
Epoch	55	MSE:	0.0001559048832859844
Epoch	56	MSE:	0.00014775843010284007
Epoch	57	MSE:	0.00017878417565952986

Epoch 58 MSE: 0.00019791844533756375
 Epoch 59 MSE: 0.00018043819000013173
 Epoch 60 MSE: 0.0001659086556173861
 Epoch 61 MSE: 0.00016636497457511723
 Epoch 62 MSE: 0.0001515565818408504
 Epoch 63 MSE: 0.00012573276762850583
 Epoch 64 MSE: 0.00012022441660519689
 Epoch 65 MSE: 0.00012960191816091537
 Epoch 66 MSE: 0.00012937095016241074
 Epoch 67 MSE: 0.00012512411922216415
 Epoch 68 MSE: 0.00013066337851341814
 Epoch 69 MSE: 0.00013425563520286232
 Epoch 70 MSE: 0.00012463299208320677
 Epoch 71 MSE: 0.0001143340123235248
 Epoch 72 MSE: 0.00011232681572437286
 Epoch 73 MSE: 0.0001090371297323145
 Epoch 74 MSE: 0.00010229462350253016
 Epoch 75 MSE: 0.00010213439963990822
 Epoch 76 MSE: 0.00010653513891156763
 Epoch 77 MSE: 0.00010571795428404585
 Epoch 78 MSE: 0.00010257239773636684
 Epoch 79 MSE: 0.00010244380246149376
 Epoch 80 MSE: 0.00010036485764430836
 Epoch 81 MSE: 9.484994370723143e-05
 Epoch 82 MSE: 9.220679203281179e-05
 Epoch 83 MSE: 9.238265920430422e-05
 Epoch 84 MSE: 9.094436973100528e-05
 Epoch 85 MSE: 8.970429917098954e-05
 Epoch 86 MSE: 9.061129094334319e-05
 Epoch 87 MSE: 9.021440928336233e-05
 Epoch 88 MSE: 8.776136382948607e-05
 Epoch 89 MSE: 8.628127397969365e-05
 Epoch 90 MSE: 8.527203317498788e-05
 Epoch 91 MSE: 8.315730519825593e-05
 Epoch 92 MSE: 8.183064346667379e-05
 Epoch 93 MSE: 8.189453365048394e-05
 Epoch 94 MSE: 8.13181177363731e-05
 Epoch 95 MSE: 8.034346683416516e-05
 Epoch 96 MSE: 8.001896640053019e-05
 Epoch 97 MSE: 7.918218761915341e-05
 Epoch 98 MSE: 7.765303598716855e-05
 Epoch 99 MSE: 7.67369128880091e-05
 T-time: 7.340830326080322

=====
 Train Score: 0.26 RMSE
 =====
 Validation Score: 8.91 RMSE

=====

Epoch	0	MSE:	0.03802943229675293
Epoch	1	MSE:	0.032343484461307526
Epoch	2	MSE:	0.03325287625193596
Epoch	3	MSE:	0.03205745294690132
Epoch	4	MSE:	0.029616938903927803
Epoch	5	MSE:	0.027972757816314697
Epoch	6	MSE:	0.0267972219735384
Epoch	7	MSE:	0.02503165416419506
Epoch	8	MSE:	0.022328585386276245
Epoch	9	MSE:	0.019478648900985718
Epoch	10	MSE:	0.01762983202934265
Epoch	11	MSE:	0.01599186845123768
Epoch	12	MSE:	0.013019567355513573
Epoch	13	MSE:	0.010455413721501827
Epoch	14	MSE:	0.008998037315905094
Epoch	15	MSE:	0.006527467630803585
Epoch	16	MSE:	0.004716497380286455
Epoch	17	MSE:	0.0036773746833205223
Epoch	18	MSE:	0.002660722006112337
Epoch	19	MSE:	0.0022078712936490774
Epoch	20	MSE:	0.002793322317302227
Epoch	21	MSE:	0.002801052061840892
Epoch	22	MSE:	0.0030199741013348103
Epoch	23	MSE:	0.002545987954363227
Epoch	24	MSE:	0.0017130895284935832
Epoch	25	MSE:	0.001369559089653194
Epoch	26	MSE:	0.001118310377933085
Epoch	27	MSE:	0.0016328484052792192
Epoch	28	MSE:	0.0019065128872171044
Epoch	29	MSE:	0.001991968834772706
Epoch	30	MSE:	0.0018296599155291915
Epoch	31	MSE:	0.0013502661604434252
Epoch	32	MSE:	0.0011078735115006566
Epoch	33	MSE:	0.0008505926234647632
Epoch	34	MSE:	0.0009283379768021405
Epoch	35	MSE:	0.0010610708268359303
Epoch	36	MSE:	0.0011206634808331728
Epoch	37	MSE:	0.0010916629107668996
Epoch	38	MSE:	0.0008628190262243152
Epoch	39	MSE:	0.0007309984066523612
Epoch	40	MSE:	0.0005632570246234536
Epoch	41	MSE:	0.0005737202591262758
Epoch	42	MSE:	0.0005830045556649566
Epoch	43	MSE:	0.000628706649877131
Epoch	44	MSE:	0.0006435530376620591
Epoch	45	MSE:	0.0005891544278711081

Epoch 46 MSE: 0.0005501447012647986
 Epoch 47 MSE: 0.00045637256698682904
 Epoch 48 MSE: 0.0004274841630831361
 Epoch 49 MSE: 0.000391364679671824
 Epoch 50 MSE: 0.000406360428314656
 Epoch 51 MSE: 0.00041643797885626554
 Epoch 52 MSE: 0.00042619684245437384
 Epoch 53 MSE: 0.00042159692384302616
 Epoch 54 MSE: 0.00039380346424877644
 Epoch 55 MSE: 0.00036967970663681626
 Epoch 56 MSE: 0.0003349975449964404
 Epoch 57 MSE: 0.0003234276664443314
 Epoch 58 MSE: 0.00030757029890082777
 Epoch 59 MSE: 0.00031400989973917603
 Epoch 60 MSE: 0.0003069073718506843
 Epoch 61 MSE: 0.00030932368827052414
 Epoch 62 MSE: 0.00029274364351294935
 Epoch 63 MSE: 0.0002824223483912647
 Epoch 64 MSE: 0.00026045076083391905
 Epoch 65 MSE: 0.00025035024737007916
 Epoch 66 MSE: 0.00023673434043303132
 Epoch 67 MSE: 0.00023574849183205515
 Epoch 68 MSE: 0.00022989802528172731
 Epoch 69 MSE: 0.00023032247554510832
 Epoch 70 MSE: 0.00022213546617422253
 Epoch 71 MSE: 0.0002167396160075441
 Epoch 72 MSE: 0.00020556342497002333
 Epoch 73 MSE: 0.00019801416783593595
 Epoch 74 MSE: 0.00018984726921189576
 Epoch 75 MSE: 0.00018551875837147236
 Epoch 76 MSE: 0.00018264864047523588
 Epoch 77 MSE: 0.0001789262460079044
 Epoch 78 MSE: 0.00017557853425387293
 Epoch 79 MSE: 0.00016898548346944153
 Epoch 80 MSE: 0.00016407427028752863
 Epoch 81 MSE: 0.00015704809629824013
 Epoch 82 MSE: 0.00015293812612071633
 Epoch 83 MSE: 0.00014869548613205552
 Epoch 84 MSE: 0.00014566448226105422
 Epoch 85 MSE: 0.00014315111911855638
 Epoch 86 MSE: 0.00013915020099375397
 Epoch 87 MSE: 0.00013593440235126764
 Epoch 88 MSE: 0.00013125354598741978
 Epoch 89 MSE: 0.00012722346582449973
 Epoch 90 MSE: 0.00012352765770629048
 Epoch 91 MSE: 0.00011984807497356087
 Epoch 92 MSE: 0.00011720684415195137
 Epoch 93 MSE: 0.0001139999003498815

Epoch 94 MSE: 0.00011084928701166064
Epoch 95 MSE: 0.00010766084596980363
Epoch 96 MSE: 0.00010392320837127045
Epoch 97 MSE: 0.00010082822700496763
Epoch 98 MSE: 9.788572060642764e-05
Epoch 99 MSE: 9.510454401606694e-05
T-time: 7.341888904571533

=====
Train Score: 0.29 RMSE
=====
Validation Score: 6.94 RMSE
=====

=====
Time Step = 30 | Hidden States = 16 | Num Layers = 1
=====

Epoch 0 MSE: 0.11697173863649368
Epoch 1 MSE: 0.05761765316128731
Epoch 2 MSE: 0.030711645260453224
Epoch 3 MSE: 0.030545208603143692
Epoch 4 MSE: 0.04039274901151657
Epoch 5 MSE: 0.040561381727457047
Epoch 6 MSE: 0.03285698592662811
Epoch 7 MSE: 0.02468780055642128
Epoch 8 MSE: 0.019972635433077812
Epoch 9 MSE: 0.019096899777650833
Epoch 10 MSE: 0.020361468195915222
Epoch 11 MSE: 0.021166985854506493
Epoch 12 MSE: 0.019719256088137627
Epoch 13 MSE: 0.016071006655693054
Epoch 14 MSE: 0.011613896116614342
Epoch 15 MSE: 0.008093533106148243
Epoch 16 MSE: 0.006639287807047367
Epoch 17 MSE: 0.006818080320954323
Epoch 18 MSE: 0.00651130685582757
Epoch 19 MSE: 0.004058878868818283
Epoch 20 MSE: 0.000894286553375423
Epoch 21 MSE: 0.0005521047278307378
Epoch 22 MSE: 0.003548421198502183
Epoch 23 MSE: 0.004341201391071081
Epoch 24 MSE: 0.0020897607319056988
Epoch 25 MSE: 0.0013162357499822974
Epoch 26 MSE: 0.0023737563751637936
Epoch 27 MSE: 0.0024238601326942444
Epoch 28 MSE: 0.0011583393206819892
Epoch 29 MSE: 0.00018140760948881507

Epoch	30	MSE:	0.0002516580279916525
Epoch	31	MSE:	0.0008704348583705723
Epoch	32	MSE:	0.0012585902586579323
Epoch	33	MSE:	0.001127780182287097
Epoch	34	MSE:	0.0007288441411219537
Epoch	35	MSE:	0.00046513095730915666
Epoch	36	MSE:	0.0005203788750804961
Epoch	37	MSE:	0.0007538172067143023
Epoch	38	MSE:	0.000876997655723244
Epoch	39	MSE:	0.0007317897980101407
Epoch	40	MSE:	0.00041958430665545166
Epoch	41	MSE:	0.00018076006381306797
Epoch	42	MSE:	0.00016089098062366247
Epoch	43	MSE:	0.00028803449822589755
Epoch	44	MSE:	0.000368100794730708
Epoch	45	MSE:	0.00029516243375837803
Epoch	46	MSE:	0.0001532428286736831
Epoch	47	MSE:	0.00010244784789392725
Epoch	48	MSE:	0.00018774504133034497
Epoch	49	MSE:	0.00029485695995390415
Epoch	50	MSE:	0.00029690691735595465
Epoch	51	MSE:	0.00020036209025420249
Epoch	52	MSE:	0.00011498801177367568
Epoch	53	MSE:	0.00011172807717230171
Epoch	54	MSE:	0.00015431526117026806
Epoch	55	MSE:	0.00016538389900233597
Epoch	56	MSE:	0.00012232120207045227
Epoch	57	MSE:	7.075844041537493e-05
Epoch	58	MSE:	6.0886693972861394e-05
Epoch	59	MSE:	9.227888949681073e-05
Epoch	60	MSE:	0.00012325840361882
Epoch	61	MSE:	0.000121568918984849
Epoch	62	MSE:	9.530015086056665e-05
Epoch	63	MSE:	7.573464245069772e-05
Epoch	64	MSE:	7.939319038996473e-05
Epoch	65	MSE:	9.305828280048445e-05
Epoch	66	MSE:	9.364834113512188e-05
Epoch	67	MSE:	7.594106864416972e-05
Epoch	68	MSE:	5.653306288877502e-05
Epoch	69	MSE:	5.257003431324847e-05
Epoch	70	MSE:	6.233104795683175e-05
Epoch	71	MSE:	6.990422116359696e-05
Epoch	72	MSE:	6.574757571797818e-05
Epoch	73	MSE:	5.66548878850881e-05
Epoch	74	MSE:	5.443838017527014e-05
Epoch	75	MSE:	6.0237889556447044e-05
Epoch	76	MSE:	6.456921983044595e-05
Epoch	77	MSE:	6.0701611801050603e-05

```

Epoch 78 MSE: 5.2631487051257864e-05
Epoch 79 MSE: 4.857435851590708e-05
Epoch 80 MSE: 5.0404745707055554e-05
Epoch 81 MSE: 5.275727380649187e-05
Epoch 82 MSE: 5.114371015224606e-05
Epoch 83 MSE: 4.736760092782788e-05
Epoch 84 MSE: 4.601200998877175e-05
Epoch 85 MSE: 4.803898264071904e-05
Epoch 86 MSE: 5.0042282964568585e-05
Epoch 87 MSE: 4.912710573989898e-05
Epoch 88 MSE: 4.637303572962992e-05
Epoch 89 MSE: 4.47807033197023e-05
Epoch 90 MSE: 4.5187574869487435e-05
Epoch 91 MSE: 4.565707786241546e-05
Epoch 92 MSE: 4.455666567082517e-05
Epoch 93 MSE: 4.272762089385651e-05
Epoch 94 MSE: 4.201464253128506e-05
Epoch 95 MSE: 4.264771268935874e-05
Epoch 96 MSE: 4.315274418331683e-05
Epoch 97 MSE: 4.254098530509509e-05
Epoch 98 MSE: 4.149098094785586e-05
Epoch 99 MSE: 4.1096078348346055e-05
T-time: 5.675626039505005

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=====
Train Score: 0.19 RMSE
=====
Validation Score: 4.93 RMSE
=====

```

```

Epoch 0 MSE: 0.11837781220674515
Epoch 1 MSE: 0.09170772135257721
Epoch 2 MSE: 0.06772030889987946
Epoch 3 MSE: 0.04684718698263168
Epoch 4 MSE: 0.030036889016628265
Epoch 5 MSE: 0.02001727558672428
Epoch 6 MSE: 0.020158864557743073
Epoch 7 MSE: 0.027314167469739914
Epoch 8 MSE: 0.030450504273176193
Epoch 9 MSE: 0.02642448991537094
Epoch 10 MSE: 0.019344253465533257
Epoch 11 MSE: 0.012726797722280025
Epoch 12 MSE: 0.008827732875943184
Epoch 13 MSE: 0.006731756497174501
Epoch 14 MSE: 0.005575546529144049
Epoch 15 MSE: 0.004406242165714502
Epoch 16 MSE: 0.003260029247030616
Epoch 17 MSE: 0.0020435932092368603

```

Epoch	18	MSE:	0.0013429205864667892
Epoch	19	MSE:	0.0017330643022432923
Epoch	20	MSE:	0.002445710590109229
Epoch	21	MSE:	0.002230728743597865
Epoch	22	MSE:	0.0017903039697557688
Epoch	23	MSE:	0.0019183693220838904
Epoch	24	MSE:	0.0023459051735699177
Epoch	25	MSE:	0.0025322232395410538
Epoch	26	MSE:	0.00229846965521574
Epoch	27	MSE:	0.0017998996190726757
Epoch	28	MSE:	0.0013362329918891191
Epoch	29	MSE:	0.001109876437112689
Epoch	30	MSE:	0.0011286423541605473
Epoch	31	MSE:	0.0011711844708770514
Epoch	32	MSE:	0.0010610781610012054
Epoch	33	MSE:	0.0008542826399207115
Epoch	34	MSE:	0.0007018379401415586
Epoch	35	MSE:	0.0006668834248557687
Epoch	36	MSE:	0.0007031720597296953
Epoch	37	MSE:	0.0007260054117068648
Epoch	38	MSE:	0.0006805112352594733
Epoch	39	MSE:	0.0005828909925185144
Epoch	40	MSE:	0.0004793155239894986
Epoch	41	MSE:	0.00039136980194598436
Epoch	42	MSE:	0.00033165502827614546
Epoch	43	MSE:	0.0002828448486980051
Epoch	44	MSE:	0.00022590119624510407
Epoch	45	MSE:	0.00016700786363799125
Epoch	46	MSE:	0.00013159227091819048
Epoch	47	MSE:	0.00013282072904985398
Epoch	48	MSE:	0.00015328962763305753
Epoch	49	MSE:	0.00015745572454761714
Epoch	50	MSE:	0.00013294436212163419
Epoch	51	MSE:	0.00010373975965194404
Epoch	52	MSE:	9.544124623062089e-05
Epoch	53	MSE:	0.00010089040733873844
Epoch	54	MSE:	9.908053471008316e-05
Epoch	55	MSE:	8.714669820619747e-05
Epoch	56	MSE:	8.034604979911819e-05
Epoch	57	MSE:	8.653281111037359e-05
Epoch	58	MSE:	9.564332867739722e-05
Epoch	59	MSE:	9.476490231463686e-05
Epoch	60	MSE:	8.431828609900549e-05
Epoch	61	MSE:	7.523352542193606e-05
Epoch	62	MSE:	7.364069460891187e-05
Epoch	63	MSE:	7.423987699439749e-05
Epoch	64	MSE:	7.02601537341252e-05
Epoch	65	MSE:	6.412403308786452e-05

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Epoch 66 MSE: 6.271014717640355e-05
Epoch 67 MSE: 6.625935930060223e-05
Epoch 68 MSE: 6.836317334091291e-05
Epoch 69 MSE: 6.554339051945135e-05
Epoch 70 MSE: 6.128794484538957e-05
Epoch 71 MSE: 5.9739268181147054e-05
Epoch 72 MSE: 5.968887489871122e-05
Epoch 73 MSE: 5.776868056273088e-05
Epoch 74 MSE: 5.441494067781605e-05
Epoch 75 MSE: 5.2832077926723287e-05
Epoch 76 MSE: 5.366573532228358e-05
Epoch 77 MSE: 5.431301178759895e-05
Epoch 78 MSE: 5.310223423293792e-05
Epoch 79 MSE: 5.132859223522246e-05
Epoch 80 MSE: 5.0593578635016456e-05
Epoch 81 MSE: 5.029164094594307e-05
Epoch 82 MSE: 4.903706212644465e-05
Epoch 83 MSE: 4.71862695121672e-05
Epoch 84 MSE: 4.6182929509086534e-05
Epoch 85 MSE: 4.617670856532641e-05
Epoch 86 MSE: 4.598693340085447e-05
Epoch 87 MSE: 4.511100996751338e-05
Epoch 88 MSE: 4.4271513615967706e-05
Epoch 89 MSE: 4.391911352286115e-05
Epoch 90 MSE: 4.3483796616783366e-05
Epoch 91 MSE: 4.251650534570217e-05
Epoch 92 MSE: 4.149408414377831e-05
Epoch 93 MSE: 4.0957544115372e-05
Epoch 94 MSE: 4.066606561536901e-05
Epoch 95 MSE: 4.01527649955824e-05
Epoch 96 MSE: 3.951215330744162e-05
Epoch 97 MSE: 3.908166763721965e-05
Epoch 98 MSE: 3.8770991523051634e-05
Epoch 99 MSE: 3.825699968729168e-05
T-time: 5.3828041553497314

```

```

=====
Train Score: 0.18 RMSE
=====
Validation Score: 1.44 RMSE
=====

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```

=====
Time Step = 30 | Hidden States = 16 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.1067127138376236
Epoch 1 MSE: 0.041797880083322525

```

Epoch 2 MSE: 0.0635981634259224
Epoch 3 MSE: 0.051264479756355286
Epoch 4 MSE: 0.034963108599185944
Epoch 5 MSE: 0.03419181704521179
Epoch 6 MSE: 0.03854495659470558
Epoch 7 MSE: 0.03637799993157387
Epoch 8 MSE: 0.029408304020762444
Epoch 9 MSE: 0.024768918752670288
Epoch 10 MSE: 0.025908634066581726
Epoch 11 MSE: 0.025984447449445724
Epoch 12 MSE: 0.020140763372182846
Epoch 13 MSE: 0.014651145786046982
Epoch 14 MSE: 0.014552832581102848
Epoch 15 MSE: 0.014279761351644993
Epoch 16 MSE: 0.00771391112357378
Epoch 17 MSE: 0.003523818915709853
Epoch 18 MSE: 0.0063589029014110565
Epoch 19 MSE: 0.0019636109936982393
Epoch 20 MSE: 0.0062391567043960094
Epoch 21 MSE: 0.005020209588110447
Epoch 22 MSE: 0.0036720086354762316
Epoch 23 MSE: 0.005154712591320276
Epoch 24 MSE: 0.0013923653168603778
Epoch 25 MSE: 0.0013857195153832436
Epoch 26 MSE: 0.002607685513794422
Epoch 27 MSE: 0.0017668388318270445
Epoch 28 MSE: 0.0010972602758556604
Epoch 29 MSE: 0.001852358807809651
Epoch 30 MSE: 0.0025682055857032537
Epoch 31 MSE: 0.002132253721356392
Epoch 32 MSE: 0.0013702419819310308
Epoch 33 MSE: 0.0012778699165210128
Epoch 34 MSE: 0.001471176277846098
Epoch 35 MSE: 0.0011001521488651633
Epoch 36 MSE: 0.00045901889097876847
Epoch 37 MSE: 0.0004824106290470809
Epoch 38 MSE: 0.0009202268556691706
Epoch 39 MSE: 0.0008517063106410205
Epoch 40 MSE: 0.0006408887566067278
Epoch 41 MSE: 0.0008642466855235398
Epoch 42 MSE: 0.0009140026522800326
Epoch 43 MSE: 0.0005436803912743926
Epoch 44 MSE: 0.00036934754461981356
Epoch 45 MSE: 0.0004759846779052168
Epoch 46 MSE: 0.0004554733168333769
Epoch 47 MSE: 0.00034055119613185525
Epoch 48 MSE: 0.0003929841914214194
Epoch 49 MSE: 0.0005249769310466945

Epoch	50	MSE:	0.0005079376860521734
Epoch	51	MSE:	0.00038965255953371525
Epoch	52	MSE:	0.0003535627038218081
Epoch	53	MSE:	0.0003726370050571859
Epoch	54	MSE:	0.0003114719584118575
Epoch	55	MSE:	0.0002301374770468101
Epoch	56	MSE:	0.0002570475044194609
Epoch	57	MSE:	0.000315123877953738
Epoch	58	MSE:	0.00029253592947497964
Epoch	59	MSE:	0.00026482297107577324
Epoch	60	MSE:	0.0002893961500376463
Epoch	61	MSE:	0.00027877421234734356
Epoch	62	MSE:	0.00022101838840171695
Epoch	63	MSE:	0.00020457810023799539
Epoch	64	MSE:	0.00022397158318199217
Epoch	65	MSE:	0.00021654341253452003
Epoch	66	MSE:	0.00020099437097087502
Epoch	67	MSE:	0.00021481259318534285
Epoch	68	MSE:	0.00022541206271853298
Epoch	69	MSE:	0.00020492398471105844
Epoch	70	MSE:	0.00018672729493118823
Epoch	71	MSE:	0.00018863238801714033
Epoch	72	MSE:	0.0001830397523008287
Epoch	73	MSE:	0.00016830737877171487
Epoch	74	MSE:	0.00017045659478753805
Epoch	75	MSE:	0.00017958617536351085
Epoch	76	MSE:	0.00017343656509183347
Epoch	77	MSE:	0.00016561656957492232
Epoch	78	MSE:	0.00016662388225086033
Epoch	79	MSE:	0.0001613549975445494
Epoch	80	MSE:	0.00015087313659023494
Epoch	81	MSE:	0.00014986598398536444
Epoch	82	MSE:	0.00015226495452225208
Epoch	83	MSE:	0.00014847041165921837
Epoch	84	MSE:	0.00014596266555599868
Epoch	85	MSE:	0.00014711235417053103
Epoch	86	MSE:	0.0001435540325473994
Epoch	87	MSE:	0.00013745347678195685
Epoch	88	MSE:	0.00013587177090812474
Epoch	89	MSE:	0.00013486496754921973
Epoch	90	MSE:	0.00013146302080713212
Epoch	91	MSE:	0.00013048757682554424
Epoch	92	MSE:	0.00013083552767056972
Epoch	93	MSE:	0.0001280757860513404
Epoch	94	MSE:	0.0001251223002327606
Epoch	95	MSE:	0.0001239947887370363
Epoch	96	MSE:	0.00012171274283900857
Epoch	97	MSE:	0.00011916290532099083

Epoch 98 MSE: 0.00011859015648951754
Epoch 99 MSE: 0.00011772439029300585
T-time: 11.162540197372437

=====

Train Score: 0.32 RMSE

=====

Validation Score: 8.21 RMSE

=====

Epoch 0 MSE: 0.05051815137267113
Epoch 1 MSE: 0.035026248544454575
Epoch 2 MSE: 0.034311823546886444
Epoch 3 MSE: 0.036925725638866425
Epoch 4 MSE: 0.03144912049174309
Epoch 5 MSE: 0.028038011863827705
Epoch 6 MSE: 0.027341146022081375
Epoch 7 MSE: 0.02668996900320053
Epoch 8 MSE: 0.02452930063009262
Epoch 9 MSE: 0.021306157112121582
Epoch 10 MSE: 0.018578611314296722
Epoch 11 MSE: 0.016846414655447006
Epoch 12 MSE: 0.014181463047862053
Epoch 13 MSE: 0.009277529083192348
Epoch 14 MSE: 0.004900599364191294
Epoch 15 MSE: 0.002928005065768957
Epoch 16 MSE: 0.0010474803857505322
Epoch 17 MSE: 0.000958760385401547
Epoch 18 MSE: 0.003941815346479416
Epoch 19 MSE: 0.0045535569079220295
Epoch 20 MSE: 0.003580390941351652
Epoch 21 MSE: 0.0035638194531202316
Epoch 22 MSE: 0.0034907415974885225
Epoch 23 MSE: 0.002395112067461014
Epoch 24 MSE: 0.0011871416354551911
Epoch 25 MSE: 0.0011355956085026264
Epoch 26 MSE: 0.001957820961251855
Epoch 27 MSE: 0.0022134706377983093
Epoch 28 MSE: 0.0018272611778229475
Epoch 29 MSE: 0.0017083290731534362
Epoch 30 MSE: 0.0016933076549321413
Epoch 31 MSE: 0.001414899481460452
Epoch 32 MSE: 0.0008862881222739816
Epoch 33 MSE: 0.00043419579742476344
Epoch 34 MSE: 0.00038480141665786505
Epoch 35 MSE: 0.0005942038842476904
Epoch 36 MSE: 0.0006243662792257965
Epoch 37 MSE: 0.0005102031282149255

Epoch	38	MSE:	0.0005328659317456186
Epoch	39	MSE:	0.0006228481070138514
Epoch	40	MSE:	0.0005523687577806413
Epoch	41	MSE:	0.0003279162338003516
Epoch	42	MSE:	0.000254482205491513
Epoch	43	MSE:	0.0004491614527069032
Epoch	44	MSE:	0.0003988945099990815
Epoch	45	MSE:	0.0002906854497268796
Epoch	46	MSE:	0.00039125443436205387
Epoch	47	MSE:	0.00043944932986050844
Epoch	48	MSE:	0.0002942840219475329
Epoch	49	MSE:	0.00020787429821211845
Epoch	50	MSE:	0.0002661723119672388
Epoch	51	MSE:	0.00023390684509649873
Epoch	52	MSE:	0.00015311651804950088
Epoch	53	MSE:	0.00020498853700701147
Epoch	54	MSE:	0.00024728922289796174
Epoch	55	MSE:	0.00018020212883129716
Epoch	56	MSE:	0.0001582519616931677
Epoch	57	MSE:	0.00018766222638078034
Epoch	58	MSE:	0.00014601738075725734
Epoch	59	MSE:	0.00011337372416164726
Epoch	60	MSE:	0.0001476851903134957
Epoch	61	MSE:	0.00015330656606238335
Epoch	62	MSE:	0.000125233200378716
Epoch	63	MSE:	0.00013434022548608482
Epoch	64	MSE:	0.00014379576896317303
Epoch	65	MSE:	0.00011400896619306877
Epoch	66	MSE:	0.00010404930071672425
Epoch	67	MSE:	0.0001173647033283487
Epoch	68	MSE:	0.00010715925600379705
Epoch	69	MSE:	9.91116976365447e-05
Epoch	70	MSE:	0.00011296290904283524
Epoch	71	MSE:	0.00010845866927411407
Epoch	72	MSE:	9.486645285505801e-05
Epoch	73	MSE:	9.900712029775605e-05
Epoch	74	MSE:	9.657310147304088e-05
Epoch	75	MSE:	8.644742047181353e-05
Epoch	76	MSE:	9.072443208424374e-05
Epoch	77	MSE:	9.377735841553658e-05
Epoch	78	MSE:	8.68986826390028e-05
Epoch	79	MSE:	8.721862104721367e-05
Epoch	80	MSE:	8.812166925054044e-05
Epoch	81	MSE:	8.103139407467097e-05
Epoch	82	MSE:	7.930185529403389e-05
Epoch	83	MSE:	8.11227728263475e-05
Epoch	84	MSE:	7.718617416685447e-05
Epoch	85	MSE:	7.617699884576723e-05

Epoch 86 MSE: 7.7380558650475e-05
Epoch 87 MSE: 7.341608579736203e-05
Epoch 88 MSE: 7.105417171260342e-05
Epoch 89 MSE: 7.095611363183707e-05
Epoch 90 MSE: 6.77508651278913e-05
Epoch 91 MSE: 6.626292451983318e-05
Epoch 92 MSE: 6.651211879216135e-05
Epoch 93 MSE: 6.411681533791125e-05
Epoch 94 MSE: 6.251839658943936e-05
Epoch 95 MSE: 6.193121953401715e-05
Epoch 96 MSE: 5.940639675827697e-05
Epoch 97 MSE: 5.78860126552172e-05
Epoch 98 MSE: 5.7255980209447443e-05
Epoch 99 MSE: 5.531753777177073e-05
T-time: 11.950053930282593

=====
Train Score: 0.22 RMSE
=====
Validation Score: 2.30 RMSE
=====

=====
Time Step = 30 | Hidden States = 32 | Num Layers = 1
=====

Epoch 0 MSE: 0.049295082688331604
Epoch 1 MSE: 0.03979667276144028
Epoch 2 MSE: 0.03974452242255211
Epoch 3 MSE: 0.023254582658410072
Epoch 4 MSE: 0.021575437858700752
Epoch 5 MSE: 0.019107364118099213
Epoch 6 MSE: 0.008192019537091255
Epoch 7 MSE: 0.013318395242094994
Epoch 8 MSE: 0.0034822612069547176
Epoch 9 MSE: 0.005840053781867027
Epoch 10 MSE: 0.004316344391554594
Epoch 11 MSE: 0.0023619290441274643
Epoch 12 MSE: 0.0046929907985031605
Epoch 13 MSE: 0.00036526081385090947
Epoch 14 MSE: 0.0011299800826236606
Epoch 15 MSE: 0.0025745341554284096
Epoch 16 MSE: 0.001749901450239122
Epoch 17 MSE: 0.000853529607411474
Epoch 18 MSE: 0.0012326834257692099
Epoch 19 MSE: 0.0018111097160726786
Epoch 20 MSE: 0.0013629747554659843
Epoch 21 MSE: 0.0003909874358214438

Epoch 22 MSE: 0.00018431215721648186
 Epoch 23 MSE: 0.0007419657194986939
 Epoch 24 MSE: 0.0008447710424661636
 Epoch 25 MSE: 0.0003508182126097381
 Epoch 26 MSE: 0.00030557686113752425
 Epoch 27 MSE: 0.0006934496341273189
 Epoch 28 MSE: 0.0006217446643859148
 Epoch 29 MSE: 0.00018074306717608124
 Epoch 30 MSE: 6.108441448304802e-05
 Epoch 31 MSE: 0.0002820733352564275
 Epoch 32 MSE: 0.0003859972348436713
 Epoch 33 MSE: 0.00025249135796912014
 Epoch 34 MSE: 0.0001474153104936704
 Epoch 35 MSE: 0.00021882273722440004
 Epoch 36 MSE: 0.00030577965662814677
 Epoch 37 MSE: 0.00023264679475687444
 Epoch 38 MSE: 8.122420695144683e-05
 Epoch 39 MSE: 4.816541695618071e-05
 Epoch 40 MSE: 0.00013549184950534254
 Epoch 41 MSE: 0.00016957487969193608
 Epoch 42 MSE: 0.00010483156074769795
 Epoch 43 MSE: 7.444737275363877e-05
 Epoch 44 MSE: 0.00012279406655579805
 Epoch 45 MSE: 0.00013821429456584156
 Epoch 46 MSE: 7.723113958491012e-05
 Epoch 47 MSE: 3.288984589744359e-05
 Epoch 48 MSE: 5.815542317577638e-05
 Epoch 49 MSE: 9.093456174014136e-05
 Epoch 50 MSE: 7.76853266870603e-05
 Epoch 51 MSE: 5.247525405138731e-05
 Epoch 52 MSE: 5.921120828134008e-05
 Epoch 53 MSE: 7.631830521859229e-05
 Epoch 54 MSE: 6.41039150650613e-05
 Epoch 55 MSE: 3.6733497836394235e-05
 Epoch 56 MSE: 3.421527799218893e-05
 Epoch 57 MSE: 5.204253830015659e-05
 Epoch 58 MSE: 5.4925087169976905e-05
 Epoch 59 MSE: 4.189806350041181e-05
 Epoch 60 MSE: 4.001975685241632e-05
 Epoch 61 MSE: 4.880649066762999e-05
 Epoch 62 MSE: 4.588577212416567e-05
 Epoch 63 MSE: 3.3286603866145015e-05
 Epoch 64 MSE: 3.125104558421299e-05
 Epoch 65 MSE: 3.938682857551612e-05
 Epoch 66 MSE: 4.109355722903274e-05
 Epoch 67 MSE: 3.52856659446843e-05
 Epoch 68 MSE: 3.409859345993027e-05
 Epoch 69 MSE: 3.775236109504476e-05

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Epoch 70 MSE: 3.6372963222675025e-05
Epoch 71 MSE: 3.0770865123486146e-05
Epoch 72 MSE: 3.0196833904483356e-05
Epoch 73 MSE: 3.400662535568699e-05
Epoch 74 MSE: 3.421611472731456e-05
Epoch 75 MSE: 3.138730608043261e-05
Epoch 76 MSE: 3.144778747810051e-05
Epoch 77 MSE: 3.2933676266111434e-05
Epoch 78 MSE: 3.1378705898532644e-05
Epoch 79 MSE: 2.912171657953877e-05
Epoch 80 MSE: 2.9923921829322353e-05
Epoch 81 MSE: 3.141873821732588e-05
Epoch 82 MSE: 3.062776158913039e-05
Epoch 83 MSE: 2.9565762815764174e-05
Epoch 84 MSE: 3.0105193218332715e-05
Epoch 85 MSE: 3.0269355193013325e-05
Epoch 86 MSE: 2.907308589783497e-05
Epoch 87 MSE: 2.8611751986318268e-05
Epoch 88 MSE: 2.941269485745579e-05
Epoch 89 MSE: 2.9551893021562137e-05
Epoch 90 MSE: 2.885109461203683e-05
Epoch 91 MSE: 2.877604310924653e-05
Epoch 92 MSE: 2.904696339101065e-05
Epoch 93 MSE: 2.861639586626552e-05
Epoch 94 MSE: 2.8142445444245823e-05
Epoch 95 MSE: 2.8395321351126768e-05
Epoch 96 MSE: 2.8606389605556615e-05
Epoch 97 MSE: 2.8277741876081564e-05
Epoch 98 MSE: 2.8092867069062777e-05
Epoch 99 MSE: 2.8213875339133665e-05
T-time: 11.027218103408813

```

```

=====
Train Score: 0.16 RMSE
=====
Validation Score: 3.26 RMSE
=====

```

```

Epoch 0 MSE: 0.04205101728439331
Epoch 1 MSE: 0.04135453328490257
Epoch 2 MSE: 0.03230201452970505
Epoch 3 MSE: 0.030650507658720016
Epoch 4 MSE: 0.0293758325278759
Epoch 5 MSE: 0.024880150333046913
Epoch 6 MSE: 0.022773221135139465
Epoch 7 MSE: 0.020975029096007347
Epoch 8 MSE: 0.016452781856060028
Epoch 9 MSE: 0.012916277162730694

```

Epoch	10	MSE:	0.0110430046916008
Epoch	11	MSE:	0.006241408176720142
Epoch	12	MSE:	0.002685930347070098
Epoch	13	MSE:	0.0012929978547617793
Epoch	14	MSE:	0.001336737652309239
Epoch	15	MSE:	0.00462092412635684
Epoch	16	MSE:	0.004720503930002451
Epoch	17	MSE:	0.002505316399037838
Epoch	18	MSE:	0.0007192942430265248
Epoch	19	MSE:	0.0005070383194833994
Epoch	20	MSE:	0.0009156455053016543
Epoch	21	MSE:	0.0016080888453871012
Epoch	22	MSE:	0.0021905868779867887
Epoch	23	MSE:	0.0022385595366358757
Epoch	24	MSE:	0.0018214626470580697
Epoch	25	MSE:	0.001206043642014265
Epoch	26	MSE:	0.000660247344058007
Epoch	27	MSE:	0.0003468524955678731
Epoch	28	MSE:	0.00025468264357186854
Epoch	29	MSE:	0.0004709401691798121
Epoch	30	MSE:	0.0008092123898677528
Epoch	31	MSE:	0.0009333147318102419
Epoch	32	MSE:	0.0006665056571364403
Epoch	33	MSE:	0.00040989150875248015
Epoch	34	MSE:	0.00029659169376827776
Epoch	35	MSE:	0.00017309167014900595
Epoch	36	MSE:	0.00023010258155409247
Epoch	37	MSE:	0.0003980014007538557
Epoch	38	MSE:	0.00044235336827114224
Epoch	39	MSE:	0.00039810093585401773
Epoch	40	MSE:	0.0003637470945250243
Epoch	41	MSE:	0.0002727460814639926
Epoch	42	MSE:	0.00013942648365627974
Epoch	43	MSE:	0.00010942869266727939
Epoch	44	MSE:	0.00015030332724563777
Epoch	45	MSE:	0.00016952621808741242
Epoch	46	MSE:	0.00021233675943221897
Epoch	47	MSE:	0.00022135199105832726
Epoch	48	MSE:	0.0001490727299824357
Epoch	49	MSE:	0.00010267207835568115
Epoch	50	MSE:	8.47571573103778e-05
Epoch	51	MSE:	7.083558011800051e-05
Epoch	52	MSE:	9.883721941150725e-05
Epoch	53	MSE:	0.0001286415645154193
Epoch	54	MSE:	0.00012023618910461664
Epoch	55	MSE:	0.00010710935021052137
Epoch	56	MSE:	8.736267773201689e-05
Epoch	57	MSE:	5.6622186093591154e-05

Epoch 58 MSE: 5.462953413370997e-05
 Epoch 59 MSE: 6.734654016327113e-05
 Epoch 60 MSE: 7.255403033923358e-05
 Epoch 61 MSE: 8.22818255983293e-05
 Epoch 62 MSE: 7.443981303367764e-05
 Epoch 63 MSE: 5.6022090575424954e-05
 Epoch 64 MSE: 5.032271656091325e-05
 Epoch 65 MSE: 4.575284765451215e-05
 Epoch 66 MSE: 4.9553418648429215e-05
 Epoch 67 MSE: 5.865525236004032e-05
 Epoch 68 MSE: 5.67960123589728e-05
 Epoch 69 MSE: 5.298872201819904e-05
 Epoch 70 MSE: 4.717795309261419e-05
 Epoch 71 MSE: 3.940904207411222e-05
 Epoch 72 MSE: 4.0637660276843235e-05
 Epoch 73 MSE: 4.296216866350733e-05
 Epoch 74 MSE: 4.4601601985050365e-05
 Epoch 75 MSE: 4.581660687108524e-05
 Epoch 76 MSE: 4.095325493835844e-05
 Epoch 77 MSE: 3.7711139157181606e-05
 Epoch 78 MSE: 3.607963662943803e-05
 Epoch 79 MSE: 3.567721068975516e-05
 Epoch 80 MSE: 3.8203445001272485e-05
 Epoch 81 MSE: 3.801744605880231e-05
 Epoch 82 MSE: 3.690956509672105e-05
 Epoch 83 MSE: 3.5053715691901743e-05
 Epoch 84 MSE: 3.259530058130622e-05
 Epoch 85 MSE: 3.275676499470137e-05
 Epoch 86 MSE: 3.290958557045087e-05
 Epoch 87 MSE: 3.3434822398703545e-05
 Epoch 88 MSE: 3.32073905155994e-05
 Epoch 89 MSE: 3.157847822876647e-05
 Epoch 90 MSE: 3.0724422686034814e-05
 Epoch 91 MSE: 2.98330432997318e-05
 Epoch 92 MSE: 3.0044902814552188e-05
 Epoch 93 MSE: 3.027205093530938e-05
 Epoch 94 MSE: 2.987736115755979e-05
 Epoch 95 MSE: 2.9382288630586118e-05
 Epoch 96 MSE: 2.8336336981737986e-05
 Epoch 97 MSE: 2.798439163598232e-05
 Epoch 98 MSE: 2.7783244149759412e-05
 Epoch 99 MSE: 2.7784430130850524e-05
 T-time: 10.320210695266724

=====

Train Score: 0.16 RMSE

=====

Validation Score: 2.01 RMSE

=====

=====

Time Step = 30 | Hidden States = 32 | Num Layers = 2

=====

Epoch	0	MSE:	0.057030294090509415
Epoch	1	MSE:	0.19113998115062714
Epoch	2	MSE:	0.03379056602716446
Epoch	3	MSE:	0.053339164704084396
Epoch	4	MSE:	0.05368189886212349
Epoch	5	MSE:	0.035264745354652405
Epoch	6	MSE:	0.026704389601945877
Epoch	7	MSE:	0.03654397651553154
Epoch	8	MSE:	0.03494611382484436
Epoch	9	MSE:	0.02331729419529438
Epoch	10	MSE:	0.01910550147294998
Epoch	11	MSE:	0.020969608798623085
Epoch	12	MSE:	0.01989055797457695
Epoch	13	MSE:	0.012157928198575974
Epoch	14	MSE:	0.004503715317696333
Epoch	15	MSE:	0.008814998902380466
Epoch	16	MSE:	0.0042708744294941425
Epoch	17	MSE:	0.004501829389482737
Epoch	18	MSE:	0.00871396716684103
Epoch	19	MSE:	0.0022550730500370264
Epoch	20	MSE:	0.0012769837630912662
Epoch	21	MSE:	0.003009222215041518
Epoch	22	MSE:	0.002214904874563217
Epoch	23	MSE:	0.001341708586551249
Epoch	24	MSE:	0.001897222246043384
Epoch	25	MSE:	0.0027596470899879932
Epoch	26	MSE:	0.002733758883550763
Epoch	27	MSE:	0.001800626632757485
Epoch	28	MSE:	0.0008660684106871486
Epoch	29	MSE:	0.0007175059290602803
Epoch	30	MSE:	0.0010380229214206338
Epoch	31	MSE:	0.0008987350156530738
Epoch	32	MSE:	0.0004129858280066401
Epoch	33	MSE:	0.0004758140130434185
Epoch	34	MSE:	0.001007994287647307
Epoch	35	MSE:	0.0011268308153375983
Epoch	36	MSE:	0.0006695648771710694
Epoch	37	MSE:	0.00030792574398219585
Epoch	38	MSE:	0.0003730269381776452
Epoch	39	MSE:	0.000481205788673833
Epoch	40	MSE:	0.00035663897870108485
Epoch	41	MSE:	0.00022849316883366555

Epoch 42 MSE: 0.0003119389002677053
 Epoch 43 MSE: 0.0004774258122779429
 Epoch 44 MSE: 0.0004968628054484725
 Epoch 45 MSE: 0.00035032673622481525
 Epoch 46 MSE: 0.0002147961495211348
 Epoch 47 MSE: 0.00021079201542306691
 Epoch 48 MSE: 0.00025022620684467256
 Epoch 49 MSE: 0.00020701257744804025
 Epoch 50 MSE: 0.00013655117072630674
 Epoch 51 MSE: 0.00016069483535829931
 Epoch 52 MSE: 0.00024159626627806574
 Epoch 53 MSE: 0.00025028607342392206
 Epoch 54 MSE: 0.00017887435387820005
 Epoch 55 MSE: 0.00013196680811233819
 Epoch 56 MSE: 0.0001454885205021128
 Epoch 57 MSE: 0.00015198234177660197
 Epoch 58 MSE: 0.00012160051119280979
 Epoch 59 MSE: 0.00010572167957434431
 Epoch 60 MSE: 0.0001311755768256262
 Epoch 61 MSE: 0.00015559840539935976
 Epoch 62 MSE: 0.00014193712559062988
 Epoch 63 MSE: 0.00011233776604058221
 Epoch 64 MSE: 0.00010430251859361306
 Epoch 65 MSE: 0.00011130698840133846
 Epoch 66 MSE: 0.00010461026249686256
 Epoch 67 MSE: 8.955403609434143e-05
 Epoch 68 MSE: 9.18517544050701e-05
 Epoch 69 MSE: 0.00010646247392287478
 Epoch 70 MSE: 0.00010738568380475044
 Epoch 71 MSE: 9.382425923831761e-05
 Epoch 72 MSE: 8.669326052768156e-05
 Epoch 73 MSE: 8.934784273151308e-05
 Epoch 74 MSE: 8.730521949473768e-05
 Epoch 75 MSE: 7.982452370924875e-05
 Epoch 76 MSE: 7.928368722787127e-05
 Epoch 77 MSE: 8.53856690810062e-05
 Epoch 78 MSE: 8.628297655377537e-05
 Epoch 79 MSE: 8.02856229711324e-05
 Epoch 80 MSE: 7.656816887902096e-05
 Epoch 81 MSE: 7.728430500719696e-05
 Epoch 82 MSE: 7.591867324663326e-05
 Epoch 83 MSE: 7.201219705166295e-05
 Epoch 84 MSE: 7.155240018619224e-05
 Epoch 85 MSE: 7.412180275423452e-05
 Epoch 86 MSE: 7.383298361673951e-05
 Epoch 87 MSE: 7.067456317599863e-05
 Epoch 88 MSE: 6.922583997948095e-05
 Epoch 89 MSE: 6.931586540304124e-05

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Epoch 90 MSE: 6.783101707696915e-05
Epoch 91 MSE: 6.589944678125903e-05
Epoch 92 MSE: 6.608022522414103e-05
Epoch 93 MSE: 6.681826926069334e-05
Epoch 94 MSE: 6.576804298674688e-05
Epoch 95 MSE: 6.417343684006482e-05
Epoch 96 MSE: 6.370300252456218e-05
Epoch 97 MSE: 6.325494905468076e-05
Epoch 98 MSE: 6.197476614033803e-05
Epoch 99 MSE: 6.119403406046331e-05
T-time: 34.230958223342896

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=====
Train Score: 0.23 RMSE
=====
Validation Score: 6.13 RMSE
=====

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```

Epoch 0 MSE: 0.08032264560461044
Epoch 1 MSE: 0.035551685839891434
Epoch 2 MSE: 0.05116846412420273
Epoch 3 MSE: 0.04154995083808899
Epoch 4 MSE: 0.033302243798971176
Epoch 5 MSE: 0.031155791133642197
Epoch 6 MSE: 0.031337346881628036
Epoch 7 MSE: 0.03104843571782112
Epoch 8 MSE: 0.028952408581972122
Epoch 9 MSE: 0.025274645537137985
Epoch 10 MSE: 0.021876228973269463
Epoch 11 MSE: 0.020408067852258682
Epoch 12 MSE: 0.020139390602707863
Epoch 13 MSE: 0.014192149043083191
Epoch 14 MSE: 0.008553129620850086
Epoch 15 MSE: 0.005493247415870428
Epoch 16 MSE: 0.0029248050414025784
Epoch 17 MSE: 0.00039923895383253694
Epoch 18 MSE: 0.004988205619156361
Epoch 19 MSE: 0.004192923661321402
Epoch 20 MSE: 0.003033807035535574
Epoch 21 MSE: 0.004022234585136175
Epoch 22 MSE: 0.003264114959165454
Epoch 23 MSE: 0.0011859379010275006
Epoch 24 MSE: 0.0004674609808716923
Epoch 25 MSE: 0.0023112338967621326
Epoch 26 MSE: 0.002315842779353261
Epoch 27 MSE: 0.0009322544210590422
Epoch 28 MSE: 0.0009870636276900768
Epoch 29 MSE: 0.001548962783999741

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Epoch	30	MSE:	0.0014694989658892155
Epoch	31	MSE:	0.0007473838049918413
Epoch	32	MSE:	0.00019985841936431825
Epoch	33	MSE:	0.0004861953784711659
Epoch	34	MSE:	0.0009089138475246727
Epoch	35	MSE:	0.0005565552273765206
Epoch	36	MSE:	0.00016840013267938048
Epoch	37	MSE:	0.0003518753801472485
Epoch	38	MSE:	0.0006105397478677332
Epoch	39	MSE:	0.0004665311425924301
Epoch	40	MSE:	0.00013540498912334442
Epoch	41	MSE:	0.00014247219951357692
Epoch	42	MSE:	0.0004337899445090443
Epoch	43	MSE:	0.000349457492120564
Epoch	44	MSE:	0.0001060503491316922
Epoch	45	MSE:	0.0001747085334500298
Epoch	46	MSE:	0.0003238439094275236
Epoch	47	MSE:	0.0002457944501657039
Epoch	48	MSE:	8.178892312571406e-05
Epoch	49	MSE:	0.00011869287845911458
Epoch	50	MSE:	0.00024003033468034118
Epoch	51	MSE:	0.00016651426267344505
Epoch	52	MSE:	7.306098996195942e-05
Epoch	53	MSE:	0.00012503174366429448
Epoch	54	MSE:	0.00017768134421203285
Epoch	55	MSE:	0.00012896090629510581
Epoch	56	MSE:	6.268874130910262e-05
Epoch	57	MSE:	8.841182716423646e-05
Epoch	58	MSE:	0.0001338555885013193
Epoch	59	MSE:	9.413640509592369e-05
Epoch	60	MSE:	5.910187610425055e-05
Epoch	61	MSE:	8.58085259096697e-05
Epoch	62	MSE:	0.00010465980449225754
Epoch	63	MSE:	7.666425517527387e-05
Epoch	64	MSE:	5.294810398481786e-05
Epoch	65	MSE:	7.063599332468584e-05
Epoch	66	MSE:	8.35168466437608e-05
Epoch	67	MSE:	6.167042010929435e-05
Epoch	68	MSE:	4.910775169264525e-05
Epoch	69	MSE:	6.256724009290338e-05
Epoch	70	MSE:	6.610661512240767e-05
Epoch	71	MSE:	4.8834524932317436e-05
Epoch	72	MSE:	4.2326249968027696e-05
Epoch	73	MSE:	5.4733034630771726e-05
Epoch	74	MSE:	5.139585482538678e-05
Epoch	75	MSE:	3.7977231841068715e-05
Epoch	76	MSE:	4.24158715759404e-05
Epoch	77	MSE:	4.7519028157694265e-05

Epoch 78 MSE: 3.794903386733495e-05
Epoch 79 MSE: 3.4167351259384304e-05
Epoch 80 MSE: 4.086664557689801e-05
Epoch 81 MSE: 3.671753438538872e-05
Epoch 82 MSE: 3.115051003987901e-05
Epoch 83 MSE: 3.553550777724013e-05
Epoch 84 MSE: 3.488095899228938e-05
Epoch 85 MSE: 2.9133896532584913e-05
Epoch 86 MSE: 3.129536708001979e-05
Epoch 87 MSE: 3.233586176065728e-05
Epoch 88 MSE: 2.7757540010497905e-05
Epoch 89 MSE: 2.8623830075957812e-05
Epoch 90 MSE: 2.9776119845337234e-05
Epoch 91 MSE: 2.624420631036628e-05
Epoch 92 MSE: 2.6290481400792487e-05
Epoch 93 MSE: 2.736355054366868e-05
Epoch 94 MSE: 2.4705157557036728e-05
Epoch 95 MSE: 2.4535429474781267e-05
Epoch 96 MSE: 2.5264382202294655e-05
Epoch 97 MSE: 2.3218064598040655e-05
Epoch 98 MSE: 2.2893096684128977e-05
Epoch 99 MSE: 2.3428816348314285e-05
T-time: 29.321353435516357

=====
Train Score: 0.14 RMSE
=====
Validation Score: 1.04 RMSE
=====

=====
Time Step = 50 | Hidden States = 2 | Num Layers = 1
=====

Epoch 0 MSE: 0.31157857179641724
Epoch 1 MSE: 0.274465948343277
Epoch 2 MSE: 0.24015702307224274
Epoch 3 MSE: 0.20867601037025452
Epoch 4 MSE: 0.17999505996704102
Epoch 5 MSE: 0.1540389060974121
Epoch 6 MSE: 0.13069333136081696
Epoch 7 MSE: 0.10981853306293488
Epoch 8 MSE: 0.09126532077789307
Epoch 9 MSE: 0.07489178329706192
Epoch 10 MSE: 0.060576099902391434
Epoch 11 MSE: 0.048222679644823074
Epoch 12 MSE: 0.0377601683139801
Epoch 13 MSE: 0.029132669791579247

Epoch	14	MSE:	0.022286368533968925
Epoch	15	MSE:	0.01715448871254921
Epoch	16	MSE:	0.013642610050737858
Epoch	17	MSE:	0.011616221629083157
Epoch	18	MSE:	0.010891943238675594
Epoch	19	MSE:	0.011234398931264877
Epoch	20	MSE:	0.012361180037260056
Epoch	21	MSE:	0.013957939110696316
Epoch	22	MSE:	0.015703720971941948
Epoch	23	MSE:	0.0173029862344265
Epoch	24	MSE:	0.018517430871725082
Epoch	25	MSE:	0.01918960176408291
Epoch	26	MSE:	0.01925242878496647
Epoch	27	MSE:	0.01872378960251808
Epoch	28	MSE:	0.017689146101474762
Epoch	29	MSE:	0.016277816146612167
Epoch	30	MSE:	0.014638300985097885
Epoch	31	MSE:	0.012916686944663525
Epoch	32	MSE:	0.011240355670452118
Epoch	33	MSE:	0.009707864373922348
Epoch	34	MSE:	0.008384647779166698
Epoch	35	MSE:	0.007303559221327305
Epoch	36	MSE:	0.006468869745731354
Epoch	37	MSE:	0.0058623491786420345
Epoch	38	MSE:	0.005450138356536627
Epoch	39	MSE:	0.005189417861402035
Epoch	40	MSE:	0.005034234840422869
Epoch	41	MSE:	0.004940156824886799
Epoch	42	MSE:	0.004867653828114271
Epoch	43	MSE:	0.004784300457686186
Epoch	44	MSE:	0.004665947053581476
Epoch	45	MSE:	0.004497068468481302
Epoch	46	MSE:	0.004270454403012991
Epoch	47	MSE:	0.003986436408013105
Epoch	48	MSE:	0.003651742357760668
Epoch	49	MSE:	0.003278110409155488
Epoch	50	MSE:	0.002880724845454097
Epoch	51	MSE:	0.0024765883572399616
Epoch	52	MSE:	0.002082879189401865
Epoch	53	MSE:	0.001715409685857594
Epoch	54	MSE:	0.0013872695853933692
Epoch	55	MSE:	0.0011077712988480926
Epoch	56	MSE:	0.0008817793568596244
Epoch	57	MSE:	0.0007095119799487293
Epoch	58	MSE:	0.000586838461458683
Epoch	59	MSE:	0.0005060596740804613
Epoch	60	MSE:	0.00045707420213148
Epoch	61	MSE:	0.00042877771193161607

```

Epoch 62 MSE: 0.00041050775325857103
Epoch 63 MSE: 0.00039330203435383737
Epoch 64 MSE: 0.00037082150811329484
Epoch 65 MSE: 0.0003397826221771538
Epoch 66 MSE: 0.0002998964337166399
Epoch 67 MSE: 0.000253351463470608
Epoch 68 MSE: 0.00020399711502250284
Epoch 69 MSE: 0.00015637239266652614
Epoch 70 MSE: 0.00011478723172331229
Epoch 71 MSE: 8.25768947834149e-05
Epoch 72 MSE: 6.16390971117653e-05
Epoch 73 MSE: 5.227417204878293e-05
Epoch 74 MSE: 5.331104694050737e-05
Epoch 75 MSE: 6.244683027034625e-05
Epoch 76 MSE: 7.671258208574727e-05
Epoch 77 MSE: 9.297105862060562e-05
Epoch 78 MSE: 0.00010836675937753171
Epoch 79 MSE: 0.00012066662748111412
Epoch 80 MSE: 0.0001284603786189109
Epoch 81 MSE: 0.00013121635129209608
Epoch 82 MSE: 0.00012919901928398758
Epoch 83 MSE: 0.00012329264427535236
Epoch 84 MSE: 0.00011476130748633295
Epoch 85 MSE: 0.00010499406198505312
Epoch 86 MSE: 9.52768386923708e-05
Epoch 87 MSE: 8.661391620989889e-05
Epoch 88 MSE: 7.962813833728433e-05
Epoch 89 MSE: 7.453519356204197e-05
Epoch 90 MSE: 7.118922803783789e-05
Epoch 91 MSE: 6.917998689459637e-05
Epoch 92 MSE: 6.795713125029579e-05
Epoch 93 MSE: 6.69574219500646e-05
Epoch 94 MSE: 6.571174162672833e-05
Epoch 95 MSE: 6.391639180947095e-05
Epoch 96 MSE: 6.146222585812211e-05
Epoch 97 MSE: 5.842357131768949e-05
Epoch 98 MSE: 5.501417399500497e-05
Epoch 99 MSE: 5.152740050107241e-05
T-time: 4.240572452545166

```

```

=====
Train Score: 0.21 RMSE
=====
Validation Score: 7.29 RMSE
=====

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Epoch 0 MSE: 0.38251420855522156
Epoch 1 MSE: 0.35181182622909546

```

Epoch	2	MSE:	0.32369449734687805
Epoch	3	MSE:	0.29795703291893005
Epoch	4	MSE:	0.27435585856437683
Epoch	5	MSE:	0.25269076228141785
Epoch	6	MSE:	0.23277676105499268
Epoch	7	MSE:	0.21447035670280457
Epoch	8	MSE:	0.19763889908790588
Epoch	9	MSE:	0.18216072022914886
Epoch	10	MSE:	0.16792914271354675
Epoch	11	MSE:	0.15484730899333954
Epoch	12	MSE:	0.14282549917697906
Epoch	13	MSE:	0.13177983462810516
Epoch	14	MSE:	0.12163210660219193
Epoch	15	MSE:	0.11241607367992401
Epoch	16	MSE:	0.10674384981393814
Epoch	17	MSE:	0.10176607966423035
Epoch	18	MSE:	0.09720056504011154
Epoch	19	MSE:	0.09293875098228455
Epoch	20	MSE:	0.0889308825135231
Epoch	21	MSE:	0.0851457342505455
Epoch	22	MSE:	0.08155158907175064
Epoch	23	MSE:	0.07812110334634781
Epoch	24	MSE:	0.0748385414481163
Epoch	25	MSE:	0.07168788462877274
Epoch	26	MSE:	0.06865624338388443
Epoch	27	MSE:	0.06573276966810226
Epoch	28	MSE:	0.06290300190448761
Epoch	29	MSE:	0.06014883890748024
Epoch	30	MSE:	0.057457197457551956
Epoch	31	MSE:	0.05481176823377609
Epoch	32	MSE:	0.05219603329896927
Epoch	33	MSE:	0.0496007464826107
Epoch	34	MSE:	0.047019828110933304
Epoch	35	MSE:	0.04444627836346626
Epoch	36	MSE:	0.04187759384512901
Epoch	37	MSE:	0.039318766444921494
Epoch	38	MSE:	0.03678276017308235
Epoch	39	MSE:	0.03429441154003143
Epoch	40	MSE:	0.03191019967198372
Epoch	41	MSE:	0.02968771383166313
Epoch	42	MSE:	0.028316570445895195
Epoch	43	MSE:	0.02701506018638611
Epoch	44	MSE:	0.025083182379603386
Epoch	45	MSE:	0.022663593292236328
Epoch	46	MSE:	0.02073654532432556
Epoch	47	MSE:	0.01917991042137146
Epoch	48	MSE:	0.01772434450685978
Epoch	49	MSE:	0.01634795404970646

Epoch	50	MSE:	0.015054458752274513
Epoch	51	MSE:	0.013852948322892189
Epoch	52	MSE:	0.012752470560371876
Epoch	53	MSE:	0.011765259318053722
Epoch	54	MSE:	0.010898460634052753
Epoch	55	MSE:	0.010146119631826878
Epoch	56	MSE:	0.009485051035881042
Epoch	57	MSE:	0.008878364227712154
Epoch	58	MSE:	0.008290158584713936
Epoch	59	MSE:	0.007703706622123718
Epoch	60	MSE:	0.007127203047275543
Epoch	61	MSE:	0.006583131849765778
Epoch	62	MSE:	0.006092946045100689
Epoch	63	MSE:	0.005664940923452377
Epoch	64	MSE:	0.0052930619567632675
Epoch	65	MSE:	0.0049612876027822495
Epoch	66	MSE:	0.0046510170213878155
Epoch	67	MSE:	0.004347875714302063
Epoch	68	MSE:	0.004045389126986265
Epoch	69	MSE:	0.0037450266536325216
Epoch	70	MSE:	0.0034532533027231693
Epoch	71	MSE:	0.0031791527289897203
Epoch	72	MSE:	0.002928272122517228
Epoch	73	MSE:	0.002703549340367317
Epoch	74	MSE:	0.0025004770141094923
Epoch	75	MSE:	0.0023096289951354265
Epoch	76	MSE:	0.002122241538017988
Epoch	77	MSE:	0.0019351367373019457
Epoch	78	MSE:	0.001752719865180552
Epoch	79	MSE:	0.0015813243808224797
Epoch	80	MSE:	0.0014249839587137103
Epoch	81	MSE:	0.0012850681087002158
Epoch	82	MSE:	0.0011599594727158546
Epoch	83	MSE:	0.0010466203093528748
Epoch	84	MSE:	0.0009426139295101166
Epoch	85	MSE:	0.000846589682623744
Epoch	86	MSE:	0.000758872483856976
Epoch	87	MSE:	0.00068130117142573
Epoch	88	MSE:	0.0006149869877845049
Epoch	89	MSE:	0.0005647081416100264
Epoch	90	MSE:	0.0005570084904320538
Epoch	91	MSE:	0.0005467167356982827
Epoch	92	MSE:	0.0005037646624259651
Epoch	93	MSE:	0.0004442764911800623
Epoch	94	MSE:	0.0003969528479501605
Epoch	95	MSE:	0.0003748251765500754
Epoch	96	MSE:	0.0003600818454287946
Epoch	97	MSE:	0.00033583410549908876

Epoch 98 MSE: 0.0003020145813934505
Epoch 99 MSE: 0.00026648290804587305
T-time: 4.318633794784546

=====
Train Score: 0.49 RMSE
=====
Validation Score: 1.16 RMSE
=====

=====
Time Step = 50 | Hidden States = 2 | Num Layers = 2
=====

Epoch 0 MSE: 0.32251274585723877
Epoch 1 MSE: 0.2792542278766632
Epoch 2 MSE: 0.2405688315629959
Epoch 3 MSE: 0.20606914162635803
Epoch 4 MSE: 0.17512376606464386
Epoch 5 MSE: 0.14710022509098053
Epoch 6 MSE: 0.12166575342416763
Epoch 7 MSE: 0.09881794452667236
Epoch 8 MSE: 0.07874841243028641
Epoch 9 MSE: 0.06172080338001251
Epoch 10 MSE: 0.04798701032996178
Epoch 11 MSE: 0.037721067667007446
Epoch 12 MSE: 0.030959995463490486
Epoch 13 MSE: 0.027551651000976562
Epoch 14 MSE: 0.027117421850562096
Epoch 15 MSE: 0.029043367132544518
Epoch 16 MSE: 0.032517775893211365
Epoch 17 MSE: 0.036629583686590195
Epoch 18 MSE: 0.04051677882671356
Epoch 19 MSE: 0.043513208627700806
Epoch 20 MSE: 0.04523171856999397
Epoch 21 MSE: 0.04556409269571304
Epoch 22 MSE: 0.044624317437410355
Epoch 23 MSE: 0.04267236962914467
Epoch 24 MSE: 0.040041688829660416
Epoch 25 MSE: 0.037079647183418274
Epoch 26 MSE: 0.03410286828875542
Epoch 27 MSE: 0.03136730566620827
Epoch 28 MSE: 0.029051903635263443
Epoch 29 MSE: 0.027254745364189148
Epoch 30 MSE: 0.025999432429671288
Epoch 31 MSE: 0.025248751044273376
Epoch 32 MSE: 0.024922223761677742
Epoch 33 MSE: 0.024914326146245003

Epoch	34	MSE:	0.025110838934779167
Epoch	35	MSE:	0.02540198341012001
Epoch	36	MSE:	0.025691751390695572
Epoch	37	MSE:	0.025903666391968727
Epoch	38	MSE:	0.025983499363064766
Epoch	39	MSE:	0.025899583473801613
Epoch	40	MSE:	0.0256413035094738
Epoch	41	MSE:	0.025216370820999146
Epoch	42	MSE:	0.024647200480103493
Epoch	43	MSE:	0.023966707289218903
Epoch	44	MSE:	0.02321387268602848
Epoch	45	MSE:	0.022429270669817924
Epoch	46	MSE:	0.021650811657309532
Epoch	47	MSE:	0.020910030230879784
Epoch	48	MSE:	0.020229164510965347
Epoch	49	MSE:	0.019619306549429893
Epoch	50	MSE:	0.019079899415373802
Epoch	51	MSE:	0.018599584698677063
Epoch	52	MSE:	0.01815849170088768
Epoch	53	MSE:	0.017731571570038795
Epoch	54	MSE:	0.017292629927396774
Epoch	55	MSE:	0.01681847684085369
Epoch	56	MSE:	0.016292452812194824
Epoch	57	MSE:	0.015706876292824745
Epoch	58	MSE:	0.015063927508890629
Epoch	59	MSE:	0.014374884776771069
Epoch	60	MSE:	0.013657861389219761
Epoch	61	MSE:	0.01293446496129036
Epoch	62	MSE:	0.012225968763232231
Epoch	63	MSE:	0.011549688875675201
Epoch	64	MSE:	0.010916161350905895
Epoch	65	MSE:	0.010327653959393501
Epoch	66	MSE:	0.009778282605111599
Epoch	67	MSE:	0.009255764074623585
Epoch	68	MSE:	0.008744578808546066
Epoch	69	MSE:	0.008229954168200493
Epoch	70	MSE:	0.007701869588345289
Epoch	71	MSE:	0.007158142048865557
Epoch	72	MSE:	0.0066056884825229645
Epoch	73	MSE:	0.006059448234736919
Epoch	74	MSE:	0.005538989789783955
Epoch	75	MSE:	0.005063504446297884
Epoch	76	MSE:	0.004646682180464268
Epoch	77	MSE:	0.004293165169656277
Epoch	78	MSE:	0.003998064436018467
Epoch	79	MSE:	0.0037499896716326475
Epoch	80	MSE:	0.0035365717485547066
Epoch	81	MSE:	0.003350053681060672

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Epoch 82 MSE: 0.0031901546753942966
Epoch 83 MSE: 0.0030624661594629288
Epoch 84 MSE: 0.0029729953967034817
Epoch 85 MSE: 0.0029218827839940786
Epoch 86 MSE: 0.0029002961236983538
Epoch 87 MSE: 0.002892895136028528
Epoch 88 MSE: 0.0028846762143075466
Epoch 89 MSE: 0.002867706585675478
Epoch 90 MSE: 0.0028431485407054424
Epoch 91 MSE: 0.0028173974715173244
Epoch 92 MSE: 0.002795462729409337
Epoch 93 MSE: 0.002776520559564233
Epoch 94 MSE: 0.002754449611529708
Epoch 95 MSE: 0.002722322242334485
Epoch 96 MSE: 0.00267709675244987
Epoch 97 MSE: 0.0026212306693196297
Epoch 98 MSE: 0.0025605913251638412
Epoch 99 MSE: 0.002500686328858137
T-time: 9.37781286239624

```

=====

Train Score: 1.49 RMSE

=====

Validation Score: 18.89 RMSE

=====

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Epoch 0 MSE: 0.2983146607875824
Epoch 1 MSE: 0.2624007761478424
Epoch 2 MSE: 0.22686342895030975
Epoch 3 MSE: 0.19191820919513702
Epoch 4 MSE: 0.15793351829051971
Epoch 5 MSE: 0.12529034912586212
Epoch 6 MSE: 0.0944267213344574
Epoch 7 MSE: 0.06490244716405869
Epoch 8 MSE: 0.038068484514951706
Epoch 9 MSE: 0.016979778185486794
Epoch 10 MSE: 0.003872390603646636
Epoch 11 MSE: 0.0014087590388953686
Epoch 12 MSE: 0.010706746950745583
Epoch 13 MSE: 0.025127451866865158
Epoch 14 MSE: 0.03399338200688362
Epoch 15 MSE: 0.03452271595597267
Epoch 16 MSE: 0.029263250529766083
Epoch 17 MSE: 0.021767577156424522
Epoch 18 MSE: 0.014605884440243244
Epoch 19 MSE: 0.009087803773581982
Epoch 20 MSE: 0.005623484030365944
Epoch 21 MSE: 0.0040473793633282185

```

Epoch 22 MSE: 0.0039305840618908405
 Epoch 23 MSE: 0.004777329508215189
 Epoch 24 MSE: 0.0061150360852479935
 Epoch 25 MSE: 0.007545291446149349
 Epoch 26 MSE: 0.008729521185159683
 Epoch 27 MSE: 0.009535643272101879
 Epoch 28 MSE: 0.009926186874508858
 Epoch 29 MSE: 0.009911119937896729
 Epoch 30 MSE: 0.009537366218864918
 Epoch 31 MSE: 0.008879153057932854
 Epoch 32 MSE: 0.008027161471545696
 Epoch 33 MSE: 0.0070787048898637295
 Epoch 34 MSE: 0.006128082983195782
 Epoch 35 MSE: 0.005257563199847937
 Epoch 36 MSE: 0.004529489669948816
 Epoch 37 MSE: 0.003981311805546284
 Epoch 38 MSE: 0.003622346092015505
 Epoch 39 MSE: 0.003435406368225813
 Epoch 40 MSE: 0.003380151931196451
 Epoch 41 MSE: 0.003399500623345375
 Epoch 42 MSE: 0.0034316335804760456
 Epoch 43 MSE: 0.0034317488316446543
 Epoch 44 MSE: 0.003384263953194022
 Epoch 45 MSE: 0.0032308166846632957
 Epoch 46 MSE: 0.0029413083102554083
 Epoch 47 MSE: 0.0025401890743523836
 Epoch 48 MSE: 0.0020859965588897467
 Epoch 49 MSE: 0.0016459834296256304
 Epoch 50 MSE: 0.0012752197217196226
 Epoch 51 MSE: 0.001003024517558515
 Epoch 52 MSE: 0.0008244698401540518
 Epoch 53 MSE: 0.0007186877191998065
 Epoch 54 MSE: 0.0006613301229663193
 Epoch 55 MSE: 0.0006270020385272801
 Epoch 56 MSE: 0.0005936726229265332
 Epoch 57 MSE: 0.0005459401290863752
 Epoch 58 MSE: 0.00047731431550346315
 Epoch 59 MSE: 0.00038997395313344896
 Epoch 60 MSE: 0.00029245333280414343
 Epoch 61 MSE: 0.00019848736701533198
 Epoch 62 MSE: 0.0001243402366526425
 Epoch 63 MSE: 8.257530862465501e-05
 Epoch 64 MSE: 7.802040636306629e-05
 Epoch 65 MSE: 0.00010452608694322407
 Epoch 66 MSE: 0.00014782341895624995
 Epoch 67 MSE: 0.00019073208386544138
 Epoch 68 MSE: 0.0002189613733207807
 Epoch 69 MSE: 0.0002255552972201258

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Epoch 70 MSE: 0.00021210774139035493
Epoch 71 MSE: 0.00018674314196687192
Epoch 72 MSE: 0.0001599619135959074
Epoch 73 MSE: 0.0001403318892698735
Epoch 74 MSE: 0.00013171635509934276
Epoch 75 MSE: 0.00013287222827784717
Epoch 76 MSE: 0.00013889042020309716
Epoch 77 MSE: 0.00014376295439433306
Epoch 78 MSE: 0.0001427890092600137
Epoch 79 MSE: 0.00013407555525191128
Epoch 80 MSE: 0.00011881363025167957
Epoch 81 MSE: 0.00010041182395070791
Epoch 82 MSE: 8.30229910206981e-05
Epoch 83 MSE: 7.001378253335133e-05
Epoch 84 MSE: 6.294310151133686e-05
Epoch 85 MSE: 6.13116062595509e-05
Epoch 86 MSE: 6.306925206445158e-05
Epoch 87 MSE: 6.559772737091407e-05
Epoch 88 MSE: 6.673425377812237e-05
Epoch 89 MSE: 6.546001532115042e-05
Epoch 90 MSE: 6.204426608746871e-05
Epoch 91 MSE: 5.767198672401719e-05
Epoch 92 MSE: 5.3791081882081926e-05
Epoch 93 MSE: 5.1507526222849265e-05
Epoch 94 MSE: 5.118721310282126e-05
Epoch 95 MSE: 5.2438459533732384e-05
Epoch 96 MSE: 5.436624269350432e-05
Epoch 97 MSE: 5.597719064098783e-05
Epoch 98 MSE: 5.655979839502834e-05
Epoch 99 MSE: 5.5887867347337306e-05
T-time: 8.846726655960083

```

```

=====
Train Score: 0.22 RMSE
=====
Validation Score: 1.18 RMSE
=====

```

```

=====
Time Step = 50 | Hidden States = 4 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.1314907819032669
Epoch 1 MSE: 0.09966854006052017
Epoch 2 MSE: 0.07924362272024155
Epoch 3 MSE: 0.06773138791322708
Epoch 4 MSE: 0.06244795024394989
Epoch 5 MSE: 0.06076423078775406

```

Epoch 6 MSE: 0.060443390160799026
Epoch 7 MSE: 0.059954721480607986
Epoch 8 MSE: 0.05856472626328468
Epoch 9 MSE: 0.056177157908678055
Epoch 10 MSE: 0.053069353103637695
Epoch 11 MSE: 0.049662377685308456
Epoch 12 MSE: 0.046368636190891266
Epoch 13 MSE: 0.04350566491484642
Epoch 14 MSE: 0.04125552624464035
Epoch 15 MSE: 0.03965604677796364
Epoch 16 MSE: 0.038617126643657684
Epoch 17 MSE: 0.037957366555929184
Epoch 18 MSE: 0.03745410591363907
Epoch 19 MSE: 0.03689640760421753
Epoch 20 MSE: 0.03612853214144707
Epoch 21 MSE: 0.035074397921562195
Epoch 22 MSE: 0.033740054816007614
Epoch 23 MSE: 0.032198015600442886
Epoch 24 MSE: 0.030560683459043503
Epoch 25 MSE: 0.028950003907084465
Epoch 26 MSE: 0.02746882103383541
Epoch 27 MSE: 0.0261781495064497
Epoch 28 MSE: 0.02508438564836979
Epoch 29 MSE: 0.024140246212482452
Epoch 30 MSE: 0.023261072114109993
Epoch 31 MSE: 0.022353120148181915
Epoch 32 MSE: 0.021344264969229698
Epoch 33 MSE: 0.02020561695098877
Epoch 34 MSE: 0.018956728279590607
Epoch 35 MSE: 0.01765436865389347
Epoch 36 MSE: 0.016370443627238274
Epoch 37 MSE: 0.01516662072390318
Epoch 38 MSE: 0.014073211699724197
Epoch 39 MSE: 0.013078787364065647
Epoch 40 MSE: 0.012135105207562447
Epoch 41 MSE: 0.011177808046340942
Epoch 42 MSE: 0.010156177915632725
Epoch 43 MSE: 0.009058460593223572
Epoch 44 MSE: 0.00791933760046959
Epoch 45 MSE: 0.006804853677749634
Epoch 46 MSE: 0.005781357642263174
Epoch 47 MSE: 0.0048830388113856316
Epoch 48 MSE: 0.0040961443446576595
Epoch 49 MSE: 0.003373140934854746
Epoch 50 MSE: 0.002671568188816309
Epoch 51 MSE: 0.0019905902445316315
Epoch 52 MSE: 0.0013769366778433323
Epoch 53 MSE: 0.0008941838750615716

Epoch 54 MSE: 0.0005750379059463739
Epoch 55 MSE: 0.00039275368908420205
Epoch 56 MSE: 0.00028323952574282885
Epoch 57 MSE: 0.00020520255202427506
Epoch 58 MSE: 0.00017478095833212137
Epoch 59 MSE: 0.00023226845951285213
Epoch 60 MSE: 0.00037709411117248237
Epoch 61 MSE: 0.000547943520359695
Epoch 62 MSE: 0.0006765733705833554
Epoch 63 MSE: 0.0007496765465475619
Epoch 64 MSE: 0.0008012211183086038
Epoch 65 MSE: 0.0008516547386534512
Epoch 66 MSE: 0.0008767443359829485
Epoch 67 MSE: 0.0008438759832642972
Epoch 68 MSE: 0.0007587819127365947
Epoch 69 MSE: 0.0006586650852113962
Epoch 70 MSE: 0.000570029194932431
Epoch 71 MSE: 0.0004890807322226465
Epoch 72 MSE: 0.0004019462794531137
Epoch 73 MSE: 0.0003107734664808959
Epoch 74 MSE: 0.00023309970856644213
Epoch 75 MSE: 0.00018170010298490524
Epoch 76 MSE: 0.00015277392230927944
Epoch 77 MSE: 0.00013397543807514012
Epoch 78 MSE: 0.00011887882283190265
Epoch 79 MSE: 0.00011068520689150319
Epoch 80 MSE: 0.00011411037849029526
Epoch 81 MSE: 0.00012733715993817896
Epoch 82 MSE: 0.00014285888755694032
Epoch 83 MSE: 0.0001545045815873891
Epoch 84 MSE: 0.00016192416660487652
Epoch 85 MSE: 0.000168340586242266
Epoch 86 MSE: 0.0001753364340402186
Epoch 87 MSE: 0.00018078014545608312
Epoch 88 MSE: 0.00018150020332541317
Epoch 89 MSE: 0.000176933579496108
Epoch 90 MSE: 0.00016955456521827728
Epoch 91 MSE: 0.00016207627777475864
Epoch 92 MSE: 0.00015496491687372327
Epoch 93 MSE: 0.0001469301205361262
Epoch 94 MSE: 0.0001373344857711345
Epoch 95 MSE: 0.0001274484966415912
Epoch 96 MSE: 0.00011923016427317634
Epoch 97 MSE: 0.00011337002797517926
Epoch 98 MSE: 0.00010898695472860709
Epoch 99 MSE: 0.00010511052096262574
T-time: 4.362284183502197

=====

Train Score: 0.31 RMSE

=====

Validation Score: 10.12 RMSE

=====

Epoch	0	MSE:	0.1186971515417099
Epoch	1	MSE:	0.10855698585510254
Epoch	2	MSE:	0.0993562862277031
Epoch	3	MSE:	0.09089664369821548
Epoch	4	MSE:	0.08318821340799332
Epoch	5	MSE:	0.07627323269844055
Epoch	6	MSE:	0.07021825015544891
Epoch	7	MSE:	0.06503153592348099
Epoch	8	MSE:	0.06077319383621216
Epoch	9	MSE:	0.057484809309244156
Epoch	10	MSE:	0.055149517953395844
Epoch	11	MSE:	0.05363272875547409
Epoch	12	MSE:	0.052679698914289474
Epoch	13	MSE:	0.05203123390674591
Epoch	14	MSE:	0.051500193774700165
Epoch	15	MSE:	0.05096609890460968
Epoch	16	MSE:	0.050358984619379044
Epoch	17	MSE:	0.04964883625507355
Epoch	18	MSE:	0.04883632808923721
Epoch	19	MSE:	0.047943368554115295
Epoch	20	MSE:	0.04700392484664917
Epoch	21	MSE:	0.04605603963136673
Epoch	22	MSE:	0.0451357327401638
Epoch	23	MSE:	0.044272806495428085
Epoch	24	MSE:	0.04348861053586006
Epoch	25	MSE:	0.042795367538928986
Epoch	26	MSE:	0.04219669848680496
Epoch	27	MSE:	0.04168892651796341
Epoch	28	MSE:	0.04126286134123802
Epoch	29	MSE:	0.04090571030974388
Epoch	30	MSE:	0.04060285910964012
Epoch	31	MSE:	0.04033953696489334
Epoch	32	MSE:	0.0401020348072052
Epoch	33	MSE:	0.03987859934568405
Epoch	34	MSE:	0.03966003656387329
Epoch	35	MSE:	0.03943987190723419
Epoch	36	MSE:	0.039214327931404114
Epoch	37	MSE:	0.038982052356004715
Epoch	38	MSE:	0.038743700832128525
Epoch	39	MSE:	0.03850141912698746
Epoch	40	MSE:	0.038258325308561325
Epoch	41	MSE:	0.03801795467734337

Epoch 42 MSE: 0.03778379410505295
Epoch 43 MSE: 0.03755887225270271
Epoch 44 MSE: 0.037345483899116516
Epoch 45 MSE: 0.037144966423511505
Epoch 46 MSE: 0.03695766255259514
Epoch 47 MSE: 0.03678296506404877
Epoch 48 MSE: 0.036619435995817184
Epoch 49 MSE: 0.03646504878997803
Epoch 50 MSE: 0.03631743788719177
Epoch 51 MSE: 0.03617416322231293
Epoch 52 MSE: 0.036032941192388535
Epoch 53 MSE: 0.03589187189936638
Epoch 54 MSE: 0.03574955090880394
Epoch 55 MSE: 0.03560509905219078
Epoch 56 MSE: 0.03545816242694855
Epoch 57 MSE: 0.035308837890625
Epoch 58 MSE: 0.03515751287341118
Epoch 59 MSE: 0.035004738718271255
Epoch 60 MSE: 0.03485110029578209
Epoch 61 MSE: 0.03469707816839218
Epoch 62 MSE: 0.034542959183454514
Epoch 63 MSE: 0.034388795495033264
Epoch 64 MSE: 0.03423440456390381
Epoch 65 MSE: 0.03407935053110123
Epoch 66 MSE: 0.03392305597662926
Epoch 67 MSE: 0.0337647870182991
Epoch 68 MSE: 0.03360379487276077
Epoch 69 MSE: 0.033439334481954575
Epoch 70 MSE: 0.033270709216594696
Epoch 71 MSE: 0.03309732303023338
Epoch 72 MSE: 0.03291868418455124
Epoch 73 MSE: 0.03273439779877663
Epoch 74 MSE: 0.032544154673814774
Epoch 75 MSE: 0.03234768286347389
Epoch 76 MSE: 0.032144755125045776
Epoch 77 MSE: 0.03193512186408043
Epoch 78 MSE: 0.031718481332063675
Epoch 79 MSE: 0.03149449825286865
Epoch 80 MSE: 0.03126273676753044
Epoch 81 MSE: 0.031022697687149048
Epoch 82 MSE: 0.030773824080824852
Epoch 83 MSE: 0.030515475198626518
Epoch 84 MSE: 0.030247000977396965
Epoch 85 MSE: 0.02996770478785038
Epoch 86 MSE: 0.029676880687475204
Epoch 87 MSE: 0.029373839497566223
Epoch 88 MSE: 0.02905786782503128
Epoch 89 MSE: 0.02872828207910061

Epoch 90 MSE: 0.028384385630488396
Epoch 91 MSE: 0.028025459498167038
Epoch 92 MSE: 0.027650775387883186
Epoch 93 MSE: 0.02725955843925476
Epoch 94 MSE: 0.026850996538996696
Epoch 95 MSE: 0.02642422541975975
Epoch 96 MSE: 0.025978934019804
Epoch 97 MSE: 0.025520185008645058
Epoch 98 MSE: 0.025064624845981598
Epoch 99 MSE: 0.024600712582468987
T-time: 5.367801666259766

=====
Train Score: 4.68 RMSE
=====

Validation Score: 29.73 RMSE
=====

=====
Time Step = 50 | Hidden States = 4 | Num Layers = 2
=====

Epoch 0 MSE: 0.14323055744171143
Epoch 1 MSE: 0.07705433666706085
Epoch 2 MSE: 0.03166572004556656
Epoch 3 MSE: 0.011026088148355484
Epoch 4 MSE: 0.013545108959078789
Epoch 5 MSE: 0.027578530833125114
Epoch 6 MSE: 0.037618063390254974
Epoch 7 MSE: 0.03799058869481087
Epoch 8 MSE: 0.031024808064103127
Epoch 9 MSE: 0.02121022716164589
Epoch 10 MSE: 0.012492011301219463
Epoch 11 MSE: 0.007211839780211449
Epoch 12 MSE: 0.005841749254614115
Epoch 13 MSE: 0.007379276677966118
Epoch 14 MSE: 0.010138778947293758
Epoch 15 MSE: 0.012511922046542168
Epoch 16 MSE: 0.013440679758787155
Epoch 17 MSE: 0.01257496327161789
Epoch 18 MSE: 0.01020087394863367
Epoch 19 MSE: 0.007039500866085291
Epoch 20 MSE: 0.003984368871897459
Epoch 21 MSE: 0.0018196848686784506
Epoch 22 MSE: 0.0009704874246381223
Epoch 23 MSE: 0.001363926799967885
Epoch 24 MSE: 0.002479343209415674
Epoch 25 MSE: 0.003592022694647312

Epoch	26	MSE:	0.004100796300917864
Epoch	27	MSE:	0.003770773531869054
Epoch	28	MSE:	0.002780571114271879
Epoch	29	MSE:	0.0015824810834601521
Epoch	30	MSE:	0.000667296932078898
Epoch	31	MSE:	0.0003436586994212121
Epoch	32	MSE:	0.0006208047270774841
Epoch	33	MSE:	0.0012386811431497335
Epoch	34	MSE:	0.001822423655539751
Epoch	35	MSE:	0.0020742283668369055
Epoch	36	MSE:	0.0019003915367648005
Epoch	37	MSE:	0.001419444801285863
Epoch	38	MSE:	0.0008690347312949598
Epoch	39	MSE:	0.0004749122599605471
Epoch	40	MSE:	0.0003495789133012295
Epoch	41	MSE:	0.0004617781669367105
Epoch	42	MSE:	0.0006785224541090429
Epoch	43	MSE:	0.0008470647153444588
Epoch	44	MSE:	0.0008705742657184601
Epoch	45	MSE:	0.0007427729433402419
Epoch	46	MSE:	0.0005332704749889672
Epoch	47	MSE:	0.0003402528236620128
Epoch	48	MSE:	0.0002389542496530339
Epoch	49	MSE:	0.0002505249867681414
Epoch	50	MSE:	0.00034173906897194684
Epoch	51	MSE:	0.00044979582889936864
Epoch	52	MSE:	0.0005161336739547551
Epoch	53	MSE:	0.0005122342263348401
Epoch	54	MSE:	0.0004472764558158815
Epoch	55	MSE:	0.000357348209945485
Epoch	56	MSE:	0.0002840677625499666
Epoch	57	MSE:	0.00025390228256583214
Epoch	58	MSE:	0.00026773728313855827
Epoch	59	MSE:	0.0003043886099476367
Epoch	60	MSE:	0.00033465467276982963
Epoch	61	MSE:	0.0003375581873115152
Epoch	62	MSE:	0.0003101397305727005
Epoch	63	MSE:	0.0002664741186890751
Epoch	64	MSE:	0.00022777999402023852
Epoch	65	MSE:	0.00021005324379075319
Epoch	66	MSE:	0.00021619917242787778
Epoch	67	MSE:	0.00023634197714272887
Epoch	68	MSE:	0.0002550533099565655
Epoch	69	MSE:	0.00026058609364554286
Epoch	70	MSE:	0.0002507063327357173
Epoch	71	MSE:	0.00023234209220390767
Epoch	72	MSE:	0.00021611321426462382
Epoch	73	MSE:	0.00020959069661330432

Epoch 74 MSE: 0.0002133645029971376
Epoch 75 MSE: 0.00022181090025696903
Epoch 76 MSE: 0.00022742869623471051
Epoch 77 MSE: 0.00022563280072063208
Epoch 78 MSE: 0.00021705632389057428
Epoch 79 MSE: 0.0002063507417915389
Epoch 80 MSE: 0.00019875199359375983
Epoch 81 MSE: 0.00019684812286868691
Epoch 82 MSE: 0.00019947908003814518
Epoch 83 MSE: 0.00020308526291046292
Epoch 84 MSE: 0.00020428551943041384
Epoch 85 MSE: 0.00020189967472106218
Epoch 86 MSE: 0.000197271685465239
Epoch 87 MSE: 0.00019297281687613577
Epoch 88 MSE: 0.00019095301104243845
Epoch 89 MSE: 0.0001913907181005925
Epoch 90 MSE: 0.0001928560232045129
Epoch 91 MSE: 0.0001934835163410753
Epoch 92 MSE: 0.00019224493007641286
Epoch 93 MSE: 0.00018948328215628862
Epoch 94 MSE: 0.00018647241813596338
Epoch 95 MSE: 0.00018443813314661384
Epoch 96 MSE: 0.0001837677409639582
Epoch 97 MSE: 0.0001839007600210607
Epoch 98 MSE: 0.00018386775627732277
Epoch 99 MSE: 0.0001830144174164161
T-time: 7.643624782562256

=====

Train Score: 0.40 RMSE

=====

Validation Score: 10.24 RMSE

=====

Epoch 0 MSE: 0.2548750638961792
Epoch 1 MSE: 0.20947271585464478
Epoch 2 MSE: 0.17074038088321686
Epoch 3 MSE: 0.1392860859632492
Epoch 4 MSE: 0.11247456073760986
Epoch 5 MSE: 0.08983669430017471
Epoch 6 MSE: 0.07093240320682526
Epoch 7 MSE: 0.05536279454827309
Epoch 8 MSE: 0.04273531585931778
Epoch 9 MSE: 0.03266267850995064
Epoch 10 MSE: 0.024774374440312386
Epoch 11 MSE: 0.018675347790122032
Epoch 12 MSE: 0.013988408260047436
Epoch 13 MSE: 0.010368702933192253

Epoch	14	MSE:	0.007540044374763966
Epoch	15	MSE:	0.005556996446102858
Epoch	16	MSE:	0.003597826464101672
Epoch	17	MSE:	0.0018764069536700845
Epoch	18	MSE:	0.0009370867046527565
Epoch	19	MSE:	0.0009127174271270633
Epoch	20	MSE:	0.0012795000802725554
Epoch	21	MSE:	0.0013538140337914228
Epoch	22	MSE:	0.0012608020333573222
Epoch	23	MSE:	0.0013220853870734572
Epoch	24	MSE:	0.0016310728387907147
Epoch	25	MSE:	0.0020313384011387825
Epoch	26	MSE:	0.002232971368357539
Epoch	27	MSE:	0.002091008936986327
Epoch	28	MSE:	0.001665716990828514
Epoch	29	MSE:	0.0011438473593443632
Epoch	30	MSE:	0.0007185135036706924
Epoch	31	MSE:	0.00048261554911732674
Epoch	32	MSE:	0.0004241899587213993
Epoch	33	MSE:	0.00042441801633685827
Epoch	34	MSE:	0.0003465802874416113
Epoch	35	MSE:	0.00022195346537046134
Epoch	36	MSE:	0.00016692615463398397
Epoch	37	MSE:	0.00023414872703142464
Epoch	38	MSE:	0.00037366707692854106
Epoch	39	MSE:	0.0004899949417449534
Epoch	40	MSE:	0.0005202196771278977
Epoch	41	MSE:	0.00047153938794508576
Epoch	42	MSE:	0.0004000832268502563
Epoch	43	MSE:	0.0003584879741538316
Epoch	44	MSE:	0.0003576953604351729
Epoch	45	MSE:	0.00035617954563349485
Epoch	46	MSE:	0.00029604663723148406
Epoch	47	MSE:	0.0001965480187209323
Epoch	48	MSE:	0.00012560213508550078
Epoch	49	MSE:	0.0001120456654462032
Epoch	50	MSE:	0.0001240015117218718
Epoch	51	MSE:	0.00012031615915475413
Epoch	52	MSE:	9.406748722540215e-05
Epoch	53	MSE:	7.367852958850563e-05
Epoch	54	MSE:	8.66732225404121e-05
Epoch	55	MSE:	0.00011907225416507572
Epoch	56	MSE:	0.000131021675770171
Epoch	57	MSE:	0.00011256567086093128
Epoch	58	MSE:	9.193331788992509e-05
Epoch	59	MSE:	8.860564412316307e-05
Epoch	60	MSE:	9.012631926452741e-05
Epoch	61	MSE:	7.674513472011313e-05

Epoch 62 MSE: 5.09872697875835e-05
Epoch 63 MSE: 3.3276020985795185e-05
Epoch 64 MSE: 3.3359607186866924e-05
Epoch 65 MSE: 3.822182770818472e-05
Epoch 66 MSE: 3.3725857065292075e-05
Epoch 67 MSE: 2.6756553779705428e-05
Epoch 68 MSE: 2.9733075280091725e-05
Epoch 69 MSE: 3.8597165257669985e-05
Epoch 70 MSE: 4.116951458854601e-05
Epoch 71 MSE: 3.5667231713887304e-05
Epoch 72 MSE: 3.1022045732242987e-05
Epoch 73 MSE: 3.1680145184509456e-05
Epoch 74 MSE: 3.144107904518023e-05
Epoch 75 MSE: 2.57006522588199e-05
Epoch 76 MSE: 1.9562159650376998e-05
Epoch 77 MSE: 1.8304715922567993e-05
Epoch 78 MSE: 1.969542063307017e-05
Epoch 79 MSE: 1.9236835214542225e-05
Epoch 80 MSE: 1.744870314723812e-05
Epoch 81 MSE: 1.7863099856185727e-05
Epoch 82 MSE: 2.0439592844923027e-05
Epoch 83 MSE: 2.1669125999324024e-05
Epoch 84 MSE: 2.0480476450757124e-05
Epoch 85 MSE: 1.9369263100088574e-05
Epoch 86 MSE: 1.9604658518801443e-05
Epoch 87 MSE: 1.9490445993142202e-05
Epoch 88 MSE: 1.7903559637488797e-05
Epoch 89 MSE: 1.633459032746032e-05
Epoch 90 MSE: 1.620220791664906e-05
Epoch 91 MSE: 1.663383409322705e-05
Epoch 92 MSE: 1.6380989109165967e-05
Epoch 93 MSE: 1.5988274753908627e-05
Epoch 94 MSE: 1.641104245209135e-05
Epoch 95 MSE: 1.710785727482289e-05
Epoch 96 MSE: 1.7090227629523724e-05
Epoch 97 MSE: 1.66273439390352e-05
Epoch 98 MSE: 1.6515581592102535e-05
Epoch 99 MSE: 1.6583604519837536e-05
T-time: 8.104247093200684

=====
Train Score: 0.12 RMSE
=====
Validation Score: 5.93 RMSE
=====

=====
Time Step = 50 | Hidden States = 8 | Num Layers = 1

=====

Epoch 0 MSE: 0.05277542769908905
Epoch 1 MSE: 0.033643484115600586
Epoch 2 MSE: 0.027371756732463837
Epoch 3 MSE: 0.03110847808420658
Epoch 4 MSE: 0.03099544160068035
Epoch 5 MSE: 0.026062138378620148
Epoch 6 MSE: 0.02096349373459816
Epoch 7 MSE: 0.01812741532921791
Epoch 8 MSE: 0.017313720658421516
Epoch 9 MSE: 0.017013566568493843
Epoch 10 MSE: 0.015765618532896042
Epoch 11 MSE: 0.013008645735681057
Epoch 12 MSE: 0.009321438148617744
Epoch 13 MSE: 0.006111638154834509
Epoch 14 MSE: 0.004736440721899271
Epoch 15 MSE: 0.0047627962194383144
Epoch 16 MSE: 0.0036732531152665615
Epoch 17 MSE: 0.001121554640121758
Epoch 18 MSE: 0.0004215968365315348
Epoch 19 MSE: 0.0027332317549735308
Epoch 20 MSE: 0.003404169110581279
Epoch 21 MSE: 0.002193282125517726
Epoch 22 MSE: 0.00280025159008801
Epoch 23 MSE: 0.003317943075671792
Epoch 24 MSE: 0.001857275958172977
Epoch 25 MSE: 0.0007255722885020077
Epoch 26 MSE: 0.0007261766586452723
Epoch 27 MSE: 0.0008296555606648326
Epoch 28 MSE: 0.0005625989870168269
Epoch 29 MSE: 0.0002929701586253941
Epoch 30 MSE: 0.00038014983874745667
Epoch 31 MSE: 0.0007270808564499021
Epoch 32 MSE: 0.0009805804584175348
Epoch 33 MSE: 0.0009560370817780495
Epoch 34 MSE: 0.0007747067138552666
Epoch 35 MSE: 0.000650860252790153
Epoch 36 MSE: 0.0006476761191152036
Epoch 37 MSE: 0.0006514543201774359
Epoch 38 MSE: 0.0005367387784644961
Epoch 39 MSE: 0.0003211994480807334
Epoch 40 MSE: 0.00014888419536873698
Epoch 41 MSE: 0.00012414457160048187
Epoch 42 MSE: 0.0001877550093922764
Epoch 43 MSE: 0.00020443568064365536
Epoch 44 MSE: 0.00015503466420341283
Epoch 45 MSE: 0.0001450743293389678

Epoch	46	MSE:	0.00021962146274745464
Epoch	47	MSE:	0.00028736284002661705
Epoch	48	MSE:	0.0002641823666635901
Epoch	49	MSE:	0.00019160451483912766
Epoch	50	MSE:	0.0001557231298647821
Epoch	51	MSE:	0.00015864960732869804
Epoch	52	MSE:	0.00014088339230511338
Epoch	53	MSE:	9.086015052162111e-05
Epoch	54	MSE:	5.7289325923193246e-05
Epoch	55	MSE:	6.79414879414253e-05
Epoch	56	MSE:	9.484769543632865e-05
Epoch	57	MSE:	0.00010238772665616125
Epoch	58	MSE:	9.294885239796713e-05
Epoch	59	MSE:	9.154921281151474e-05
Epoch	60	MSE:	0.0001040769275277853
Epoch	61	MSE:	0.00011062443809350953
Epoch	62	MSE:	9.747299191076308e-05
Epoch	63	MSE:	7.676213863305748e-05
Epoch	64	MSE:	6.695127376588061e-05
Epoch	65	MSE:	6.73809481668286e-05
Epoch	66	MSE:	6.432925874833018e-05
Epoch	67	MSE:	5.489083196152933e-05
Epoch	68	MSE:	5.044543286203407e-05
Epoch	69	MSE:	5.670894461218268e-05
Epoch	70	MSE:	6.421079888241366e-05
Epoch	71	MSE:	6.383925210684538e-05
Epoch	72	MSE:	5.989987766952254e-05
Epoch	73	MSE:	5.991043144604191e-05
Epoch	74	MSE:	6.147837120806798e-05
Epoch	75	MSE:	5.8233730669599026e-05
Epoch	76	MSE:	5.1664203056134284e-05
Epoch	77	MSE:	4.8274796426994726e-05
Epoch	78	MSE:	4.898921542917378e-05
Epoch	79	MSE:	4.9195838073501363e-05
Epoch	80	MSE:	4.739441646961495e-05
Epoch	81	MSE:	4.680105848819949e-05
Epoch	82	MSE:	4.8723410145612434e-05
Epoch	83	MSE:	5.022453478886746e-05
Epoch	84	MSE:	4.922527296002954e-05
Epoch	85	MSE:	4.74858570669312e-05
Epoch	86	MSE:	4.699717464973219e-05
Epoch	87	MSE:	4.679109406424686e-05
Epoch	88	MSE:	4.535051994025707e-05
Epoch	89	MSE:	4.3596843170234933e-05
Epoch	90	MSE:	4.3175263272132725e-05
Epoch	91	MSE:	4.363906919024885e-05
Epoch	92	MSE:	4.3555912270676345e-05
Epoch	93	MSE:	4.3029118387494236e-05

Epoch 94 MSE: 4.305935726733878e-05
Epoch 95 MSE: 4.34273861174006e-05
Epoch 96 MSE: 4.3146741518285125e-05
Epoch 97 MSE: 4.230616832501255e-05
Epoch 98 MSE: 4.176564470981248e-05
Epoch 99 MSE: 4.158173760515638e-05
T-time: 8.075310945510864

=====
Train Score: 0.19 RMSE
=====
Validation Score: 6.50 RMSE
=====

Epoch 0 MSE: 0.05107605829834938
Epoch 1 MSE: 0.04004030302166939
Epoch 2 MSE: 0.03527151793241501
Epoch 3 MSE: 0.03595487400889397
Epoch 4 MSE: 0.03649058938026428
Epoch 5 MSE: 0.03463391587138176
Epoch 6 MSE: 0.03175199031829834
Epoch 7 MSE: 0.029292870312929153
Epoch 8 MSE: 0.027760183438658714
Epoch 9 MSE: 0.02689700946211815
Epoch 10 MSE: 0.02612174116075039
Epoch 11 MSE: 0.02497224695980549
Epoch 12 MSE: 0.023285744711756706
Epoch 13 MSE: 0.02113979309797287
Epoch 14 MSE: 0.018769217655062675
Epoch 15 MSE: 0.016430851072072983
Epoch 16 MSE: 0.014494338072836399
Epoch 17 MSE: 0.013307006098330021
Epoch 18 MSE: 0.012073840014636517
Epoch 19 MSE: 0.010792993940412998
Epoch 20 MSE: 0.009489445015788078
Epoch 21 MSE: 0.008210168220102787
Epoch 22 MSE: 0.006959737744182348
Epoch 23 MSE: 0.005710451398044825
Epoch 24 MSE: 0.0044453502632677555
Epoch 25 MSE: 0.0032381669152528048
Epoch 26 MSE: 0.002202258910983801
Epoch 27 MSE: 0.001387683441862464
Epoch 28 MSE: 0.000759642047341913
Epoch 29 MSE: 0.00038715353002771735
Epoch 30 MSE: 0.00040948999230749905
Epoch 31 MSE: 0.0006827000761404634
Epoch 32 MSE: 0.0011508691823109984
Epoch 33 MSE: 0.0017028958536684513

Epoch	34	MSE:	0.001996823586523533
Epoch	35	MSE:	0.002097015269100666
Epoch	36	MSE:	0.001881587551906705
Epoch	37	MSE:	0.0015412576030939817
Epoch	38	MSE:	0.001161094638518989
Epoch	39	MSE:	0.0007943956297822297
Epoch	40	MSE:	0.000552199489902705
Epoch	41	MSE:	0.0003902899334207177
Epoch	42	MSE:	0.0003178273618686944
Epoch	43	MSE:	0.0003285071870777756
Epoch	44	MSE:	0.0003647264966275543
Epoch	45	MSE:	0.00042428795131854713
Epoch	46	MSE:	0.0004958066856488585
Epoch	47	MSE:	0.000546063354704529
Epoch	48	MSE:	0.0005780674400739372
Epoch	49	MSE:	0.0005925691220909357
Epoch	50	MSE:	0.0005734305595979095
Epoch	51	MSE:	0.0005283391219563782
Epoch	52	MSE:	0.0004651464114431292
Epoch	53	MSE:	0.00037587559199891984
Epoch	54	MSE:	0.00026980318943969905
Epoch	55	MSE:	0.00016475051234010607
Epoch	56	MSE:	8.502617129124701e-05
Epoch	57	MSE:	8.508393511874601e-05
Epoch	58	MSE:	0.00016993246390484273
Epoch	59	MSE:	0.0002237538283225149
Epoch	60	MSE:	0.00019740679999813437
Epoch	61	MSE:	0.00012682298256549984
Epoch	62	MSE:	6.5899635956157e-05
Epoch	63	MSE:	5.141031215316616e-05
Epoch	64	MSE:	6.564151408383623e-05
Epoch	65	MSE:	7.967980491230264e-05
Epoch	66	MSE:	9.341305849375203e-05
Epoch	67	MSE:	0.00010398658196208999
Epoch	68	MSE:	9.903024329105392e-05
Epoch	69	MSE:	8.732677815714851e-05
Epoch	70	MSE:	7.763064786558971e-05
Epoch	71	MSE:	6.357915845001116e-05
Epoch	72	MSE:	4.773249747813679e-05
Epoch	73	MSE:	4.050463030580431e-05
Epoch	74	MSE:	3.5890039725927636e-05
Epoch	75	MSE:	3.5949356970377266e-05
Epoch	76	MSE:	4.342601096141152e-05
Epoch	77	MSE:	4.5397489884635434e-05
Epoch	78	MSE:	4.4929776777280495e-05
Epoch	79	MSE:	3.7954891013214365e-05
Epoch	80	MSE:	2.7990405214950442e-05
Epoch	81	MSE:	2.3677735953242518e-05

```

Epoch 82 MSE: 2.1412579371826723e-05
Epoch 83 MSE: 2.3944041458889842e-05
Epoch 84 MSE: 2.77411727438448e-05
Epoch 85 MSE: 2.9489809094229713e-05
Epoch 86 MSE: 3.103975541307591e-05
Epoch 87 MSE: 2.915106961154379e-05
Epoch 88 MSE: 2.6598685508361086e-05
Epoch 89 MSE: 2.4301105440827087e-05
Epoch 90 MSE: 2.237541957583744e-05
Epoch 91 MSE: 2.3244279873324558e-05
Epoch 92 MSE: 2.427177423669491e-05
Epoch 93 MSE: 2.548043630667962e-05
Epoch 94 MSE: 2.5487539460300468e-05
Epoch 95 MSE: 2.376167321926914e-05
Epoch 96 MSE: 2.234421481261961e-05
Epoch 97 MSE: 2.083552499243524e-05
Epoch 98 MSE: 2.0603296434273943e-05
Epoch 99 MSE: 2.093413786496967e-05
T-time: 7.4773783683776855

```

```

=====
Train Score: 0.14 RMSE
=====
Validation Score: 2.07 RMSE
=====

```

```

=====
Time Step = 50 | Hidden States = 8 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.049534283578395844
Epoch 1 MSE: 0.03613725304603577
Epoch 2 MSE: 0.04224362596869469
Epoch 3 MSE: 0.03396686911582947
Epoch 4 MSE: 0.02619454823434353
Epoch 5 MSE: 0.025210566818714142
Epoch 6 MSE: 0.025679243728518486
Epoch 7 MSE: 0.021631304174661636
Epoch 8 MSE: 0.014802113175392151
Epoch 9 MSE: 0.010425366461277008
Epoch 10 MSE: 0.010052536614239216
Epoch 11 MSE: 0.007831976749002934
Epoch 12 MSE: 0.00232359997907877
Epoch 13 MSE: 0.001172170857898891
Epoch 14 MSE: 0.0048719365149736404
Epoch 15 MSE: 0.0036352600436657667
Epoch 16 MSE: 0.004670266527682543
Epoch 17 MSE: 0.005947055295109749

```

Epoch	18	MSE:	0.002873108722269535
Epoch	19	MSE:	0.0017630826914682984
Epoch	20	MSE:	0.0019090425921604037
Epoch	21	MSE:	0.0010957331396639347
Epoch	22	MSE:	0.000485600990941748
Epoch	23	MSE:	0.0009746202267706394
Epoch	24	MSE:	0.0017804659437388182
Epoch	25	MSE:	0.0019863720517605543
Epoch	26	MSE:	0.0016921231290325522
Epoch	27	MSE:	0.001501346123404801
Epoch	28	MSE:	0.0015864038141444325
Epoch	29	MSE:	0.001566495280712843
Epoch	30	MSE:	0.0011537588434293866
Epoch	31	MSE:	0.0006095218705013394
Epoch	32	MSE:	0.0003920425660908222
Epoch	33	MSE:	0.0005012055626139045
Epoch	34	MSE:	0.0005283404607325792
Epoch	35	MSE:	0.00038635756936855614
Epoch	36	MSE:	0.00042304451926611364
Epoch	37	MSE:	0.0006802321295253932
Epoch	38	MSE:	0.0007608560263179243
Epoch	39	MSE:	0.0005761429783888161
Epoch	40	MSE:	0.0004453910223674029
Epoch	41	MSE:	0.00044673465890809894
Epoch	42	MSE:	0.0003723136323969811
Epoch	43	MSE:	0.00021913988166488707
Epoch	44	MSE:	0.00017636911070439965
Epoch	45	MSE:	0.0002590410294942558
Epoch	46	MSE:	0.0003138099564239383
Epoch	47	MSE:	0.0002923816500697285
Epoch	48	MSE:	0.00028352232766337693
Epoch	49	MSE:	0.0003177386533934623
Epoch	50	MSE:	0.0003173197037540376
Epoch	51	MSE:	0.0002495652297511697
Epoch	52	MSE:	0.00018760247621685266
Epoch	53	MSE:	0.00017994317749980837
Epoch	54	MSE:	0.0001800139871193096
Epoch	55	MSE:	0.00015494997205678374
Epoch	56	MSE:	0.00014871699386276305
Epoch	57	MSE:	0.00018066129996441305
Epoch	58	MSE:	0.00019815022824332118
Epoch	59	MSE:	0.00017967379244510084
Epoch	60	MSE:	0.00016589052393101156
Epoch	61	MSE:	0.0001662043941905722
Epoch	62	MSE:	0.00015030486974865198
Epoch	63	MSE:	0.00012481134035624564
Epoch	64	MSE:	0.00012054479884682223
Epoch	65	MSE:	0.00012999132741242647

```

Epoch 66 MSE: 0.00012924015754833817
Epoch 67 MSE: 0.00012531715037766844
Epoch 68 MSE: 0.00013119931099936366
Epoch 69 MSE: 0.00013417532318271697
Epoch 70 MSE: 0.0001240206038346514
Epoch 71 MSE: 0.00011405388795537874
Epoch 72 MSE: 0.00011227204231545329
Epoch 73 MSE: 0.00010869649122469127
Epoch 74 MSE: 0.00010207529703620821
Epoch 75 MSE: 0.00010240547271678224
Epoch 76 MSE: 0.00010674740769900382
Epoch 77 MSE: 0.00010560282680671662
Epoch 78 MSE: 0.00010255083907395601
Epoch 79 MSE: 0.00010248195758322254
Epoch 80 MSE: 0.00010011794802267104
Epoch 81 MSE: 9.457547275815159e-05
Epoch 82 MSE: 9.219706407748163e-05
Epoch 83 MSE: 9.238385973731056e-05
Epoch 84 MSE: 9.085761121241376e-05
Epoch 85 MSE: 8.975642413133755e-05
Epoch 86 MSE: 9.071014210348949e-05
Epoch 87 MSE: 9.013820817926899e-05
Epoch 88 MSE: 8.765001257415861e-05
Epoch 89 MSE: 8.62531887833029e-05
Epoch 90 MSE: 8.518608956364915e-05
Epoch 91 MSE: 8.304100629175082e-05
Epoch 92 MSE: 8.183359750546515e-05
Epoch 93 MSE: 8.192398672690615e-05
Epoch 94 MSE: 8.128220360958949e-05
Epoch 95 MSE: 8.033842459553853e-05
Epoch 96 MSE: 8.002785762073472e-05
Epoch 97 MSE: 7.911511056590825e-05
Epoch 98 MSE: 7.7586475526914e-05
Epoch 99 MSE: 7.672087667742744e-05
T-time: 10.554943561553955

```

```

=====
Train Score: 0.26 RMSE
=====
Validation Score: 8.98 RMSE
=====

```

```

Epoch 0 MSE: 0.03806096687912941
Epoch 1 MSE: 0.032404232770204544
Epoch 2 MSE: 0.03330131247639656
Epoch 3 MSE: 0.03208773955702782
Epoch 4 MSE: 0.029647933319211006
Epoch 5 MSE: 0.028005357831716537

```

Epoch 6 MSE: 0.026818061247467995
 Epoch 7 MSE: 0.02503168024122715
 Epoch 8 MSE: 0.022311845794320107
 Epoch 9 MSE: 0.019462913274765015
 Epoch 10 MSE: 0.01761730946600437
 Epoch 11 MSE: 0.015948673710227013
 Epoch 12 MSE: 0.01295458059757948
 Epoch 13 MSE: 0.010418008081614971
 Epoch 14 MSE: 0.00891593936830759
 Epoch 15 MSE: 0.006462664343416691
 Epoch 16 MSE: 0.004677792079746723
 Epoch 17 MSE: 0.0036468920297920704
 Epoch 18 MSE: 0.0026191051583737135
 Epoch 19 MSE: 0.002225121483206749
 Epoch 20 MSE: 0.002811378799378872
 Epoch 21 MSE: 0.0028137913905084133
 Epoch 22 MSE: 0.003050109837204218
 Epoch 23 MSE: 0.0025206231512129307
 Epoch 24 MSE: 0.001712970668449998
 Epoch 25 MSE: 0.001354813575744629
 Epoch 26 MSE: 0.0011272754054516554
 Epoch 27 MSE: 0.0016534191090613604
 Epoch 28 MSE: 0.0019003102788701653
 Epoch 29 MSE: 0.00200043228669524
 Epoch 30 MSE: 0.0018033006926998496
 Epoch 31 MSE: 0.0013373157707974315
 Epoch 32 MSE: 0.0010966315167024732
 Epoch 33 MSE: 0.0008370369905605912
 Epoch 34 MSE: 0.0009382194257341325
 Epoch 35 MSE: 0.0010494490852579474
 Epoch 36 MSE: 0.0011276009026914835
 Epoch 37 MSE: 0.0010753669776022434
 Epoch 38 MSE: 0.0008606372866779566
 Epoch 39 MSE: 0.0007223477005027235
 Epoch 40 MSE: 0.0005585855105891824
 Epoch 41 MSE: 0.0005760741187259555
 Epoch 42 MSE: 0.0005773025914095342
 Epoch 43 MSE: 0.0006344530847854912
 Epoch 44 MSE: 0.0006374273798428476
 Epoch 45 MSE: 0.0005923762219026685
 Epoch 46 MSE: 0.0005467407172545791
 Epoch 47 MSE: 0.0004556720668915659
 Epoch 48 MSE: 0.0004280990397091955
 Epoch 49 MSE: 0.00038855773163959384
 Epoch 50 MSE: 0.00040942206396721303
 Epoch 51 MSE: 0.0004132362373638898
 Epoch 52 MSE: 0.0004298751591704786
 Epoch 53 MSE: 0.0004183154087513685

Epoch 54 MSE: 0.0003963756316807121
 Epoch 55 MSE: 0.00036616664147004485
 Epoch 56 MSE: 0.00033632389386184514
 Epoch 57 MSE: 0.00032095686765387654
 Epoch 58 MSE: 0.00030873235664330423
 Epoch 59 MSE: 0.00031281326664611697
 Epoch 60 MSE: 0.00030762533424422145
 Epoch 61 MSE: 0.00030846864683553576
 Epoch 62 MSE: 0.0002925517037510872
 Epoch 63 MSE: 0.00028148273122496903
 Epoch 64 MSE: 0.00025984225794672966
 Epoch 65 MSE: 0.00024959957227110863
 Epoch 66 MSE: 0.00023657291603740305
 Epoch 67 MSE: 0.00023531680926680565
 Epoch 68 MSE: 0.00023029305157251656
 Epoch 69 MSE: 0.0002296616294188425
 Epoch 70 MSE: 0.00022260675905272365
 Epoch 71 MSE: 0.00021562966867350042
 Epoch 72 MSE: 0.00020617901463992894
 Epoch 73 MSE: 0.00019720036652870476
 Epoch 74 MSE: 0.00019088812405243516
 Epoch 75 MSE: 0.00018508265202399343
 Epoch 76 MSE: 0.00018345934222452343
 Epoch 77 MSE: 0.0001787747605703771
 Epoch 78 MSE: 0.00017600099090486765
 Epoch 79 MSE: 0.00016919626796152443
 Epoch 80 MSE: 0.00016400028835050762
 Epoch 81 MSE: 0.00015760384849272668
 Epoch 82 MSE: 0.00015266003902070224
 Epoch 83 MSE: 0.00014930088946130127
 Epoch 84 MSE: 0.00014551533968187869
 Epoch 85 MSE: 0.00014331407146528363
 Epoch 86 MSE: 0.00013928399130236357
 Epoch 87 MSE: 0.0001355718559352681
 Epoch 88 MSE: 0.00013153019244782627
 Epoch 89 MSE: 0.00012702003004960716
 Epoch 90 MSE: 0.00012373088975436985
 Epoch 91 MSE: 0.00012011671788059175
 Epoch 92 MSE: 0.00011706382792908698
 Epoch 93 MSE: 0.0001142173568950966
 Epoch 94 MSE: 0.00011068330059060827
 Epoch 95 MSE: 0.00010748096246970817
 Epoch 96 MSE: 0.00010393635602667928
 Epoch 97 MSE: 0.00010043832298833877
 Epoch 98 MSE: 9.761964611243457e-05
 Epoch 99 MSE: 9.477279672864825e-05
 T-time: 10.383832216262817


```
=====
Train Score: 0.29 RMSE
=====
Validation Score: 7.00 RMSE
=====
```

```
=====
Time Step = 50 | Hidden States = 16 | Num Layers = 1
=====
```

```
Epoch 0 MSE: 0.11714629083871841
Epoch 1 MSE: 0.057736773043870926
Epoch 2 MSE: 0.030777905136346817
Epoch 3 MSE: 0.030573174357414246
Epoch 4 MSE: 0.04042964428663254
Epoch 5 MSE: 0.04061933979392052
Epoch 6 MSE: 0.03291536495089531
Epoch 7 MSE: 0.02473299950361252
Epoch 8 MSE: 0.020002957433462143
Epoch 9 MSE: 0.01911684311926365
Epoch 10 MSE: 0.02037804201245308
Epoch 11 MSE: 0.021186305209994316
Epoch 12 MSE: 0.019741756841540337
Epoch 13 MSE: 0.01609179377555847
Epoch 14 MSE: 0.01162700168788433
Epoch 15 MSE: 0.008096344769001007
Epoch 16 MSE: 0.0066353618167340755
Epoch 17 MSE: 0.006814929191023111
Epoch 18 MSE: 0.006511510815471411
Epoch 19 MSE: 0.0040574143640697
Epoch 20 MSE: 0.0008904789574444294
Epoch 21 MSE: 0.0005560461431741714
Epoch 22 MSE: 0.003562245750799775
Epoch 23 MSE: 0.004348945803940296
Epoch 24 MSE: 0.0020916066132485867
Epoch 25 MSE: 0.0013164064148440957
Epoch 26 MSE: 0.002370873000472784
Epoch 27 MSE: 0.002421070821583271
Epoch 28 MSE: 0.001158353639766574
Epoch 29 MSE: 0.0001819889002945274
Epoch 30 MSE: 0.00025067070964723825
Epoch 31 MSE: 0.0008692520204931498
Epoch 32 MSE: 0.0012598605826497078
Epoch 33 MSE: 0.001131877419538796
Epoch 34 MSE: 0.0007333914400078356
Epoch 35 MSE: 0.00046741089317947626
Epoch 36 MSE: 0.0005197841092012823
Epoch 37 MSE: 0.0007521109655499458
```

Epoch 38 MSE: 0.0008763636578805745
 Epoch 39 MSE: 0.0007327336934395134
 Epoch 40 MSE: 0.00042075649253092706
 Epoch 41 MSE: 0.0001806303480407223
 Epoch 42 MSE: 0.00015938268916215748
 Epoch 43 MSE: 0.0002865457790903747
 Epoch 44 MSE: 0.0003680272202473134
 Epoch 45 MSE: 0.0002964991726912558
 Epoch 46 MSE: 0.0001547245483379811
 Epoch 47 MSE: 0.00010297376866219565
 Epoch 48 MSE: 0.00018746482965070754
 Epoch 49 MSE: 0.0002947598113678396
 Epoch 50 MSE: 0.00029751655529253185
 Epoch 51 MSE: 0.00020115180814173073
 Epoch 52 MSE: 0.00011512228229548782
 Epoch 53 MSE: 0.00011109504703199491
 Epoch 54 MSE: 0.000153623623191379
 Epoch 55 MSE: 0.00016531965229660273
 Epoch 56 MSE: 0.00012282931129448116
 Epoch 57 MSE: 7.123311661416665e-05
 Epoch 58 MSE: 6.092475450714119e-05
 Epoch 59 MSE: 9.208288247464225e-05
 Epoch 60 MSE: 0.00012329797027632594
 Epoch 61 MSE: 0.00012199141929158941
 Epoch 62 MSE: 9.578631579643115e-05
 Epoch 63 MSE: 7.589908636873588e-05
 Epoch 64 MSE: 7.921109499875456e-05
 Epoch 65 MSE: 9.284564293920994e-05
 Epoch 66 MSE: 9.367588791064918e-05
 Epoch 67 MSE: 7.615378126502037e-05
 Epoch 68 MSE: 5.6674809457035735e-05
 Epoch 69 MSE: 5.251971015240997e-05
 Epoch 70 MSE: 6.223582022357732e-05
 Epoch 71 MSE: 6.997075252002105e-05
 Epoch 72 MSE: 6.598063191631809e-05
 Epoch 73 MSE: 5.686825170414522e-05
 Epoch 74 MSE: 5.449572563520633e-05
 Epoch 75 MSE: 6.0202048189239576e-05
 Epoch 76 MSE: 6.459005089709535e-05
 Epoch 77 MSE: 6.081747778807767e-05
 Epoch 78 MSE: 5.274186696624383e-05
 Epoch 79 MSE: 4.859273030888289e-05
 Epoch 80 MSE: 5.0372709665680304e-05
 Epoch 81 MSE: 5.277956370264292e-05
 Epoch 82 MSE: 5.125026291352697e-05
 Epoch 83 MSE: 4.748727224068716e-05
 Epoch 84 MSE: 4.607543451129459e-05
 Epoch 85 MSE: 4.806206197827123e-05

```

Epoch 86 MSE: 5.00883579661604e-05
Epoch 87 MSE: 4.921566869597882e-05
Epoch 88 MSE: 4.645952139981091e-05
Epoch 89 MSE: 4.4823351345257834e-05
Epoch 90 MSE: 4.5202908950159326e-05
Epoch 91 MSE: 4.569229713524692e-05
Epoch 92 MSE: 4.4625769078265876e-05
Epoch 93 MSE: 4.280006396584213e-05
Epoch 94 MSE: 4.206367884762585e-05
Epoch 95 MSE: 4.2685296648414806e-05
Epoch 96 MSE: 4.320649532019161e-05
Epoch 97 MSE: 4.261266440153122e-05
Epoch 98 MSE: 4.155639908276498e-05
Epoch 99 MSE: 4.11409382650163e-05
T-time: 8.645240783691406

```

```

=====
Train Score: 0.19 RMSE
=====
Validation Score: 4.98 RMSE
=====

```

```

Epoch 0 MSE: 0.11857244372367859
Epoch 1 MSE: 0.09187330305576324
Epoch 2 MSE: 0.06785430759191513
Epoch 3 MSE: 0.04694848507642746
Epoch 4 MSE: 0.030105723068118095
Epoch 5 MSE: 0.02005559578537941
Epoch 6 MSE: 0.02017398364841938
Epoch 7 MSE: 0.027335796505212784
Epoch 8 MSE: 0.03049894981086254
Epoch 9 MSE: 0.026483610272407532
Epoch 10 MSE: 0.019397610798478127
Epoch 11 MSE: 0.012767206877470016
Epoch 12 MSE: 0.00885285995900631
Epoch 13 MSE: 0.0067496695555746555
Epoch 14 MSE: 0.005595796275883913
Epoch 15 MSE: 0.0044284542091190815
Epoch 16 MSE: 0.0032837484031915665
Epoch 17 MSE: 0.0020628597121685743
Epoch 18 MSE: 0.001349088503047824
Epoch 19 MSE: 0.0017258708830922842
Epoch 20 MSE: 0.0024467024486511946
Epoch 21 MSE: 0.0022413544356822968
Epoch 22 MSE: 0.001794437994249165
Epoch 23 MSE: 0.0019131364533677697
Epoch 24 MSE: 0.0023427873384207487
Epoch 25 MSE: 0.0025367895141243935

```

Epoch	26	MSE:	0.0023087989538908005
Epoch	27	MSE:	0.0018110580276697874
Epoch	28	MSE:	0.001343992305919528
Epoch	29	MSE:	0.0011131670325994492
Epoch	30	MSE:	0.001129120122641325
Epoch	31	MSE:	0.0011728514218702912
Epoch	32	MSE:	0.0010643890127539635
Epoch	33	MSE:	0.0008569419733248651
Epoch	34	MSE:	0.0007021728670224547
Epoch	35	MSE:	0.0006653633317910135
Epoch	36	MSE:	0.0007016931776888669
Epoch	37	MSE:	0.0007260696147568524
Epoch	38	MSE:	0.0006826590979471803
Epoch	39	MSE:	0.0005873364279977977
Epoch	40	MSE:	0.00048384899855591357
Epoch	41	MSE:	0.00039428772288374603
Epoch	42	MSE:	0.000332661991706118
Epoch	43	MSE:	0.00028308958280831575
Epoch	44	MSE:	0.0002264843787997961
Epoch	45	MSE:	0.0001678154949331656
Epoch	46	MSE:	0.0001318642753176391
Epoch	47	MSE:	0.0001323330943705514
Epoch	48	MSE:	0.00015265074034687132
Epoch	49	MSE:	0.00015745066048111767
Epoch	50	MSE:	0.00013393801054917276
Epoch	51	MSE:	0.0001048094272846356
Epoch	52	MSE:	9.562062768964097e-05
Epoch	53	MSE:	0.00010051162098534405
Epoch	54	MSE:	9.897124255076051e-05
Epoch	55	MSE:	8.744072692934424e-05
Epoch	56	MSE:	8.051204349612817e-05
Epoch	57	MSE:	8.630680531496182e-05
Epoch	58	MSE:	9.53988783294335e-05
Epoch	59	MSE:	9.496049460722134e-05
Epoch	60	MSE:	8.49020725581795e-05
Epoch	61	MSE:	7.576417556265369e-05
Epoch	62	MSE:	7.388937228824943e-05
Epoch	63	MSE:	7.43845957913436e-05
Epoch	64	MSE:	7.055962487356737e-05
Epoch	65	MSE:	6.449643115047365e-05
Epoch	66	MSE:	6.29293208476156e-05
Epoch	67	MSE:	6.63460887153633e-05
Epoch	68	MSE:	6.855476385680959e-05
Epoch	69	MSE:	6.595229206141084e-05
Epoch	70	MSE:	6.17780169704929e-05
Epoch	71	MSE:	6.014012251398526e-05
Epoch	72	MSE:	6.003858652547933e-05
Epoch	73	MSE:	5.818668068968691e-05

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Epoch 74 MSE: 5.488047099788673e-05
Epoch 75 MSE: 5.3229767217999324e-05
Epoch 76 MSE: 5.398124267230742e-05
Epoch 77 MSE: 5.464646892505698e-05
Epoch 78 MSE: 5.3511870646616444e-05
Epoch 79 MSE: 5.176444028620608e-05
Epoch 80 MSE: 5.100094494991936e-05
Epoch 81 MSE: 5.068739483249374e-05
Epoch 82 MSE: 4.946560875396244e-05
Epoch 83 MSE: 4.7637626266805455e-05
Epoch 84 MSE: 4.661225466406904e-05
Epoch 85 MSE: 4.657974932342768e-05
Epoch 86 MSE: 4.6403161832131445e-05
Epoch 87 MSE: 4.555690611596219e-05
Epoch 88 MSE: 4.472695218282752e-05
Epoch 89 MSE: 4.436996823642403e-05
Epoch 90 MSE: 4.394802454044111e-05
Epoch 91 MSE: 4.3004401959478855e-05
Epoch 92 MSE: 4.19898315158207e-05
Epoch 93 MSE: 4.144626291235909e-05
Epoch 94 MSE: 4.115436604479328e-05
Epoch 95 MSE: 4.065368193550967e-05
Epoch 96 MSE: 4.0022667235461995e-05
Epoch 97 MSE: 3.959217792726122e-05
Epoch 98 MSE: 3.928069054381922e-05
Epoch 99 MSE: 3.877009294228628e-05
T-time: 8.688666343688965

```

```

=====
Train Score: 0.19 RMSE
=====
Validation Score: 1.48 RMSE
=====

```

```

=====
Time Step = 50 | Hidden States = 16 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.10690668225288391
Epoch 1 MSE: 0.04187827184796333
Epoch 2 MSE: 0.06367692351341248
Epoch 3 MSE: 0.05137459933757782
Epoch 4 MSE: 0.03503628447651863
Epoch 5 MSE: 0.03422681614756584
Epoch 6 MSE: 0.038586657494306564
Epoch 7 MSE: 0.03644150123000145
Epoch 8 MSE: 0.029470885172486305
Epoch 9 MSE: 0.024804653599858284

```

Epoch	10	MSE:	0.02592478320002556
Epoch	11	MSE:	0.02601831592619419
Epoch	12	MSE:	0.020179372280836105
Epoch	13	MSE:	0.014663273468613625
Epoch	14	MSE:	0.014546523801982403
Epoch	15	MSE:	0.014287414960563183
Epoch	16	MSE:	0.007719562854617834
Epoch	17	MSE:	0.0035090346354991198
Epoch	18	MSE:	0.006362343207001686
Epoch	19	MSE:	0.0019736564718186855
Epoch	20	MSE:	0.006257076282054186
Epoch	21	MSE:	0.005034929141402245
Epoch	22	MSE:	0.0036713324952870607
Epoch	23	MSE:	0.005150590557605028
Epoch	24	MSE:	0.0013931413413956761
Epoch	25	MSE:	0.0013754984829574823
Epoch	26	MSE:	0.0026086613070219755
Epoch	27	MSE:	0.001782250707037747
Epoch	28	MSE:	0.0011048685992136598
Epoch	29	MSE:	0.001850450993515551
Epoch	30	MSE:	0.0025720547419041395
Epoch	31	MSE:	0.00214178953319788
Epoch	32	MSE:	0.001372703118249774
Epoch	33	MSE:	0.001271974528208375
Epoch	34	MSE:	0.0014680117601528764
Epoch	35	MSE:	0.0011036132927984
Epoch	36	MSE:	0.000461198971606791
Epoch	37	MSE:	0.0004806568322237581
Epoch	38	MSE:	0.000922235834877938
Epoch	39	MSE:	0.0008578207343816757
Epoch	40	MSE:	0.0006428829510696232
Epoch	41	MSE:	0.0008627495262771845
Epoch	42	MSE:	0.000915037642698735
Epoch	43	MSE:	0.0005451471661217511
Epoch	44	MSE:	0.0003677390341181308
Epoch	45	MSE:	0.000474937551189214
Epoch	46	MSE:	0.0004577481304295361
Epoch	47	MSE:	0.0003428598283790052
Epoch	48	MSE:	0.00039320968789979815
Epoch	49	MSE:	0.0005253945710137486
Epoch	50	MSE:	0.0005097324610687792
Epoch	51	MSE:	0.00039064878365024924
Epoch	52	MSE:	0.00035274270339868963
Epoch	53	MSE:	0.00037211895687505603
Epoch	54	MSE:	0.0003123291826341301
Epoch	55	MSE:	0.00023075990611687303
Epoch	56	MSE:	0.0002569821663200855
Epoch	57	MSE:	0.00031583698000758886

Epoch 58 MSE: 0.0002938588731922209
 Epoch 59 MSE: 0.0002652211987879127
 Epoch 60 MSE: 0.0002891999902203679
 Epoch 61 MSE: 0.0002791266597341746
 Epoch 62 MSE: 0.00022141686349641532
 Epoch 63 MSE: 0.0002044608409050852
 Epoch 64 MSE: 0.00022412612452171743
 Epoch 65 MSE: 0.00021729196305386722
 Epoch 66 MSE: 0.00020153986406512558
 Epoch 67 MSE: 0.0002149590727640316
 Epoch 68 MSE: 0.00022574070317205042
 Epoch 69 MSE: 0.00020535968360491097
 Epoch 70 MSE: 0.00018680271750781685
 Epoch 71 MSE: 0.00018862409342546016
 Epoch 72 MSE: 0.00018336597713641822
 Epoch 73 MSE: 0.00016867840895429254
 Epoch 74 MSE: 0.00017064192797988653
 Epoch 75 MSE: 0.00017987805767916143
 Epoch 76 MSE: 0.00017383093654643744
 Epoch 77 MSE: 0.0001657972316024825
 Epoch 78 MSE: 0.0001667094766162336
 Epoch 79 MSE: 0.0001615855871932581
 Epoch 80 MSE: 0.0001510985748609528
 Epoch 81 MSE: 0.00015000661369413137
 Epoch 82 MSE: 0.00015250450815074146
 Epoch 83 MSE: 0.0001487741101300344
 Epoch 84 MSE: 0.00014615434338338673
 Epoch 85 MSE: 0.00014726640074513853
 Epoch 86 MSE: 0.00014376617036759853
 Epoch 87 MSE: 0.0001376244326820597
 Epoch 88 MSE: 0.0001359982998110354
 Epoch 89 MSE: 0.00013506069080904126
 Epoch 90 MSE: 0.0001316837006015703
 Epoch 91 MSE: 0.0001306556077906862
 Epoch 92 MSE: 0.00013101173681207
 Epoch 93 MSE: 0.00012826919555664062
 Epoch 94 MSE: 0.0001252675283467397
 Epoch 95 MSE: 0.0001241304853465408
 Epoch 96 MSE: 0.00012188552500447258
 Epoch 97 MSE: 0.00011932665802305564
 Epoch 98 MSE: 0.00011873988842125982
 Epoch 99 MSE: 0.0001178961611003615
 T-time: 16.38895273208618

=====
 Train Score: 0.32 RMSE
 =====
 Validation Score: 8.28 RMSE

=====

Epoch	0	MSE:	0.050634246319532394
Epoch	1	MSE:	0.03510049730539322
Epoch	2	MSE:	0.03434639051556587
Epoch	3	MSE:	0.037003256380558014
Epoch	4	MSE:	0.031522881239652634
Epoch	5	MSE:	0.02808508649468422
Epoch	6	MSE:	0.027378741651773453
Epoch	7	MSE:	0.026729445904493332
Epoch	8	MSE:	0.024575412273406982
Epoch	9	MSE:	0.02135046198964119
Epoch	10	MSE:	0.018611229956150055
Epoch	11	MSE:	0.016867898404598236
Epoch	12	MSE:	0.014211272820830345
Epoch	13	MSE:	0.009311807341873646
Epoch	14	MSE:	0.004907217342406511
Epoch	15	MSE:	0.0029315557330846786
Epoch	16	MSE:	0.0010548881255090237
Epoch	17	MSE:	0.0009564621141180396
Epoch	18	MSE:	0.003937191795557737
Epoch	19	MSE:	0.004564317408949137
Epoch	20	MSE:	0.0035959745291620493
Epoch	21	MSE:	0.0035752905532717705
Epoch	22	MSE:	0.003498719073832035
Epoch	23	MSE:	0.0024016250390559435
Epoch	24	MSE:	0.001192463911138475
Epoch	25	MSE:	0.0011402758536860347
Epoch	26	MSE:	0.0019663849379867315
Epoch	27	MSE:	0.0022208455484360456
Epoch	28	MSE:	0.0018312787869945168
Epoch	29	MSE:	0.0017164178425446153
Epoch	30	MSE:	0.0017026872374117374
Epoch	31	MSE:	0.0014208342181518674
Epoch	32	MSE:	0.0008887365111149848
Epoch	33	MSE:	0.00043702477705664933
Epoch	34	MSE:	0.00038953873445279896
Epoch	35	MSE:	0.0005990025238133967
Epoch	36	MSE:	0.0006267682765610516
Epoch	37	MSE:	0.0005118238623254001
Epoch	38	MSE:	0.0005359267233870924
Epoch	39	MSE:	0.0006258985376916826
Epoch	40	MSE:	0.0005535815143957734
Epoch	41	MSE:	0.0003306053695268929
Epoch	42	MSE:	0.00025499859475530684
Epoch	43	MSE:	0.00045043762656860054
Epoch	44	MSE:	0.0004003767389804125
Epoch	45	MSE:	0.0002912092604674399

Epoch	46	MSE:	0.0003926095669157803
Epoch	47	MSE:	0.0004421672783792019
Epoch	48	MSE:	0.000296673271805048
Epoch	49	MSE:	0.0002091948117595166
Epoch	50	MSE:	0.00026756705483421683
Epoch	51	MSE:	0.0002356153418077156
Epoch	52	MSE:	0.0001537701318738982
Epoch	53	MSE:	0.0002055991062661633
Epoch	54	MSE:	0.00024910588399507105
Epoch	55	MSE:	0.0001824411010602489
Epoch	56	MSE:	0.00015921671001706272
Epoch	57	MSE:	0.0001890282437670976
Epoch	58	MSE:	0.00014776863099541515
Epoch	59	MSE:	0.00011382700176909566
Epoch	60	MSE:	0.0001478573540225625
Epoch	61	MSE:	0.0001543635007692501
Epoch	62	MSE:	0.0001261059514945373
Epoch	63	MSE:	0.0001346842327620834
Epoch	64	MSE:	0.00014485216524917632
Epoch	65	MSE:	0.0001151716205640696
Epoch	66	MSE:	0.0001043861557263881
Epoch	67	MSE:	0.00011782764340750873
Epoch	68	MSE:	0.00010806502541527152
Epoch	69	MSE:	9.945677447831258e-05
Epoch	70	MSE:	0.00011328623804729432
Epoch	71	MSE:	0.0001093865794246085
Epoch	72	MSE:	9.548478556098416e-05
Epoch	73	MSE:	9.937534923665226e-05
Epoch	74	MSE:	9.729409066494554e-05
Epoch	75	MSE:	8.698321471456438e-05
Epoch	76	MSE:	9.098863665712997e-05
Epoch	77	MSE:	9.435778338229284e-05
Epoch	78	MSE:	8.748260006541386e-05
Epoch	79	MSE:	8.761718345340341e-05
Epoch	80	MSE:	8.871342288330197e-05
Epoch	81	MSE:	8.168032218236476e-05
Epoch	82	MSE:	7.976022607181221e-05
Epoch	83	MSE:	8.17107647890225e-05
Epoch	84	MSE:	7.785221532685682e-05
Epoch	85	MSE:	7.672442006878555e-05
Epoch	86	MSE:	7.806553912814707e-05
Epoch	87	MSE:	7.415418804157525e-05
Epoch	88	MSE:	7.166530849644914e-05
Epoch	89	MSE:	7.167163130361587e-05
Epoch	90	MSE:	6.848608609288931e-05
Epoch	91	MSE:	6.689415749860927e-05
Epoch	92	MSE:	6.722666876157746e-05
Epoch	93	MSE:	6.48684726911597e-05

Epoch 94 MSE: 6.317563384072855e-05
Epoch 95 MSE: 6.263495743041858e-05
Epoch 96 MSE: 6.012424637447111e-05
Epoch 97 MSE: 5.856883944943547e-05
Epoch 98 MSE: 5.8012035879073665e-05
Epoch 99 MSE: 5.609388608718291e-05
T-time: 20.35795545578003

=====
Train Score: 0.22 RMSE
=====
Validation Score: 2.32 RMSE
=====

=====
Time Step = 50 | Hidden States = 32 | Num Layers = 1
=====

Epoch 0 MSE: 0.04938553646206856
Epoch 1 MSE: 0.0403636135160923
Epoch 2 MSE: 0.03930778428912163
Epoch 3 MSE: 0.023658521473407745
Epoch 4 MSE: 0.021030224859714508
Epoch 5 MSE: 0.01939914934337139
Epoch 6 MSE: 0.008111663162708282
Epoch 7 MSE: 0.012966211885213852
Epoch 8 MSE: 0.0037918458692729473
Epoch 9 MSE: 0.005290336906909943
Epoch 10 MSE: 0.004589627962559462
Epoch 11 MSE: 0.002202775562182069
Epoch 12 MSE: 0.004661279730498791
Epoch 13 MSE: 0.00041658603004179895
Epoch 14 MSE: 0.001034254557453096
Epoch 15 MSE: 0.002530565019696951
Epoch 16 MSE: 0.001816634787246585
Epoch 17 MSE: 0.0008951216004788876
Epoch 18 MSE: 0.0011927001178264618
Epoch 19 MSE: 0.0017679434968158603
Epoch 20 MSE: 0.0013759831199422479
Epoch 21 MSE: 0.0004144229169469327
Epoch 22 MSE: 0.00016254751244559884
Epoch 23 MSE: 0.0007049534469842911
Epoch 24 MSE: 0.0008462563855573535
Epoch 25 MSE: 0.00037236191565170884
Epoch 26 MSE: 0.0003082185867242515
Epoch 27 MSE: 0.0006826466997154057
Epoch 28 MSE: 0.0006166194216348231
Epoch 29 MSE: 0.00018180927145294845

Epoch	30	MSE:	5.968724872218445e-05
Epoch	31	MSE:	0.0002760855422820896
Epoch	32	MSE:	0.0003815076488535851
Epoch	33	MSE:	0.00025403723702766
Epoch	34	MSE:	0.00015225227980408818
Epoch	35	MSE:	0.00022134673781692982
Epoch	36	MSE:	0.0003040135488845408
Epoch	37	MSE:	0.00022939003247302026
Epoch	38	MSE:	8.004855772014707e-05
Epoch	39	MSE:	4.908640403300524e-05
Epoch	40	MSE:	0.00013528431009035558
Epoch	41	MSE:	0.00016712260548956692
Epoch	42	MSE:	0.00010376678255852312
Epoch	43	MSE:	7.720299618085846e-05
Epoch	44	MSE:	0.00012552404950838536
Epoch	45	MSE:	0.0001368693046970293
Epoch	46	MSE:	7.452776480931789e-05
Epoch	47	MSE:	3.322787961224094e-05
Epoch	48	MSE:	6.0128273617010564e-05
Epoch	49	MSE:	9.066300845006481e-05
Epoch	50	MSE:	7.589703454868868e-05
Epoch	51	MSE:	5.278749449644238e-05
Epoch	52	MSE:	6.157412281027064e-05
Epoch	53	MSE:	7.72097337176092e-05
Epoch	54	MSE:	6.26470209681429e-05
Epoch	55	MSE:	3.596903115976602e-05
Epoch	56	MSE:	3.5555436625145376e-05
Epoch	57	MSE:	5.2982275519752875e-05
Epoch	58	MSE:	5.402801252785139e-05
Epoch	59	MSE:	4.145763523411006e-05
Epoch	60	MSE:	4.1418483306188136e-05
Epoch	61	MSE:	4.988351065549068e-05
Epoch	62	MSE:	4.525405165622942e-05
Epoch	63	MSE:	3.279519296484068e-05
Epoch	64	MSE:	3.215969991288148e-05
Epoch	65	MSE:	4.017103128717281e-05
Epoch	66	MSE:	4.0717666706768796e-05
Epoch	67	MSE:	3.509640009724535e-05
Epoch	68	MSE:	3.498710066196509e-05
Epoch	69	MSE:	3.8491925806738436e-05
Epoch	70	MSE:	3.613957596826367e-05
Epoch	71	MSE:	3.064113843720406e-05
Epoch	72	MSE:	3.0867387977195904e-05
Epoch	73	MSE:	3.4516338928369805e-05
Epoch	74	MSE:	3.406402174732648e-05
Epoch	75	MSE:	3.148836549371481e-05
Epoch	76	MSE:	3.2123665732797235e-05
Epoch	77	MSE:	3.331846892251633e-05

```

Epoch 78 MSE: 3.1286475859815255e-05
Epoch 79 MSE: 2.9314996936591342e-05
Epoch 80 MSE: 3.0459012123174034e-05
Epoch 81 MSE: 3.1653828045818955e-05
Epoch 82 MSE: 3.0632669222541153e-05
Epoch 83 MSE: 2.98832146654604e-05
Epoch 84 MSE: 3.0573413823731244e-05
Epoch 85 MSE: 3.043552533199545e-05
Epoch 86 MSE: 2.915250661317259e-05
Epoch 87 MSE: 2.8950120395165868e-05
Epoch 88 MSE: 2.975648567371536e-05
Epoch 89 MSE: 2.9673137760255486e-05
Epoch 90 MSE: 2.9030898076598532e-05
Epoch 91 MSE: 2.913546995841898e-05
Epoch 92 MSE: 2.9305665520951152e-05
Epoch 93 MSE: 2.8741233109030873e-05
Epoch 94 MSE: 2.8378395654726774e-05
Epoch 95 MSE: 2.8702192139462568e-05
Epoch 96 MSE: 2.8794183890568092e-05
Epoch 97 MSE: 2.8442898837965913e-05
Epoch 98 MSE: 2.8367161576170474e-05
Epoch 99 MSE: 2.8469907192629762e-05
T-time: 21.2182674407959

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=====
Train Score: 0.16 RMSE
=====
Validation Score: 3.30 RMSE
=====

```

```

Epoch 0 MSE: 0.042136915028095245
Epoch 1 MSE: 0.04138246178627014
Epoch 2 MSE: 0.032355353236198425
Epoch 3 MSE: 0.03067164495587349
Epoch 4 MSE: 0.0293932743370533
Epoch 5 MSE: 0.02489616721868515
Epoch 6 MSE: 0.02278977446258068
Epoch 7 MSE: 0.020962856709957123
Epoch 8 MSE: 0.016418462619185448
Epoch 9 MSE: 0.012891323305666447
Epoch 10 MSE: 0.01098072063177824
Epoch 11 MSE: 0.00613761693239212
Epoch 12 MSE: 0.002685515908524394
Epoch 13 MSE: 0.0012006955221295357
Epoch 14 MSE: 0.0013953566085547209
Epoch 15 MSE: 0.0046376194804906845
Epoch 16 MSE: 0.00463296240195632
Epoch 17 MSE: 0.0024147259537130594

```

Epoch	18	MSE:	0.0006714404444210231
Epoch	19	MSE:	0.0005122307920828462
Epoch	20	MSE:	0.0009400203707627952
Epoch	21	MSE:	0.0016097880434244871
Epoch	22	MSE:	0.002156981732696295
Epoch	23	MSE:	0.0021582047920674086
Epoch	24	MSE:	0.0017256431747227907
Epoch	25	MSE:	0.0011345333186909556
Epoch	26	MSE:	0.0006352355121634901
Epoch	27	MSE:	0.0002977454278152436
Epoch	28	MSE:	0.000243704067543149
Epoch	29	MSE:	0.0005148309865035117
Epoch	30	MSE:	0.0008368667913600802
Epoch	31	MSE:	0.0009181107743643224
Epoch	32	MSE:	0.0006982398335821927
Epoch	33	MSE:	0.0004235430096741766
Epoch	34	MSE:	0.0002782975207082927
Epoch	35	MSE:	0.00016929212142713368
Epoch	36	MSE:	0.00023140943085309118
Epoch	37	MSE:	0.00038895622128620744
Epoch	38	MSE:	0.000443036638898775
Epoch	39	MSE:	0.0004130929592065513
Epoch	40	MSE:	0.0003704052360262722
Epoch	41	MSE:	0.000268552073976025
Epoch	42	MSE:	0.00014038705558050424
Epoch	43	MSE:	0.00010637506784405559
Epoch	44	MSE:	0.00013566722918767482
Epoch	45	MSE:	0.00016414053970947862
Epoch	46	MSE:	0.00021405675215646625
Epoch	47	MSE:	0.0002136018592864275
Epoch	48	MSE:	0.00014674886188004166
Epoch	49	MSE:	0.00010160024248762056
Epoch	50	MSE:	7.451515557477251e-05
Epoch	51	MSE:	6.71335292281583e-05
Epoch	52	MSE:	0.00010023565118899569
Epoch	53	MSE:	0.0001238679833477363
Epoch	54	MSE:	0.00011903801350854337
Epoch	55	MSE:	0.00010781716264318675
Epoch	56	MSE:	8.053296187426895e-05
Epoch	57	MSE:	5.312711436999962e-05
Epoch	58	MSE:	5.4345633543562144e-05
Epoch	59	MSE:	6.296914943959564e-05
Epoch	60	MSE:	7.33805718482472e-05
Epoch	61	MSE:	8.20669301901944e-05
Epoch	62	MSE:	6.883624155307189e-05
Epoch	63	MSE:	5.446682189358398e-05
Epoch	64	MSE:	4.624928624252789e-05
Epoch	65	MSE:	4.220332266413607e-05

Epoch 66 MSE: 5.0581209507072344e-05
Epoch 67 MSE: 5.606495324173011e-05
Epoch 68 MSE: 5.465653885039501e-05
Epoch 69 MSE: 5.102170689497143e-05
Epoch 70 MSE: 4.16739349020645e-05
Epoch 71 MSE: 3.7119687476661056e-05
Epoch 72 MSE: 3.835559618892148e-05
Epoch 73 MSE: 4.0190800064010546e-05
Epoch 74 MSE: 4.374358832137659e-05
Epoch 75 MSE: 4.1734489059308544e-05
Epoch 76 MSE: 3.750996620510705e-05
Epoch 77 MSE: 3.438595376792364e-05
Epoch 78 MSE: 3.2195192034123465e-05
Epoch 79 MSE: 3.4088981919921935e-05
Epoch 80 MSE: 3.523441409924999e-05
Epoch 81 MSE: 3.520174868754111e-05
Epoch 82 MSE: 3.3797306969063357e-05
Epoch 83 MSE: 3.0829560273559764e-05
Epoch 84 MSE: 2.9838873160770163e-05
Epoch 85 MSE: 2.954083538497798e-05
Epoch 86 MSE: 3.0381155738723464e-05
Epoch 87 MSE: 3.073598418268375e-05
Epoch 88 MSE: 2.9617151085403748e-05
Epoch 89 MSE: 2.8463677153922617e-05
Epoch 90 MSE: 2.706644227146171e-05
Epoch 91 MSE: 2.6996831365977414e-05
Epoch 92 MSE: 2.7146741558681242e-05
Epoch 93 MSE: 2.721221790125128e-05
Epoch 94 MSE: 2.6788569812197238e-05
Epoch 95 MSE: 2.573903475422412e-05
Epoch 96 MSE: 2.5110664864769205e-05
Epoch 97 MSE: 2.4639246475999244e-05
Epoch 98 MSE: 2.4762128305155784e-05
Epoch 99 MSE: 2.463878263370134e-05
T-time: 19.248541593551636

=====
Train Score: 0.15 RMSE
=====
Validation Score: 1.84 RMSE
=====

=====
Time Step = 50 | Hidden States = 32 | Num Layers = 2
=====

Epoch 0 MSE: 0.05715813487768173
Epoch 1 MSE: 0.19102784991264343

Epoch 2 MSE: 0.033844735473394394
Epoch 3 MSE: 0.05339650809764862
Epoch 4 MSE: 0.05372244492173195
Epoch 5 MSE: 0.03529660403728485
Epoch 6 MSE: 0.026738429442048073
Epoch 7 MSE: 0.03658122941851616
Epoch 8 MSE: 0.03496379032731056
Epoch 9 MSE: 0.023317405954003334
Epoch 10 MSE: 0.019105887040495872
Epoch 11 MSE: 0.020971398800611496
Epoch 12 MSE: 0.019870638847351074
Epoch 13 MSE: 0.012098399922251701
Epoch 14 MSE: 0.004460473544895649
Epoch 15 MSE: 0.008861137554049492
Epoch 16 MSE: 0.004208647646009922
Epoch 17 MSE: 0.004628984723240137
Epoch 18 MSE: 0.008663360960781574
Epoch 19 MSE: 0.0022024614736437798
Epoch 20 MSE: 0.001279544667340815
Epoch 21 MSE: 0.0030013525392860174
Epoch 22 MSE: 0.002217255998402834
Epoch 23 MSE: 0.001357009750790894
Epoch 24 MSE: 0.00190772267524153
Epoch 25 MSE: 0.002760215662419796
Epoch 26 MSE: 0.002730130683630705
Epoch 27 MSE: 0.0017977411625906825
Epoch 28 MSE: 0.0008629743242636323
Epoch 29 MSE: 0.0007110212463885546
Epoch 30 MSE: 0.0010300911962985992
Epoch 31 MSE: 0.0008960975101217628
Epoch 32 MSE: 0.0004173883644398302
Epoch 33 MSE: 0.0004808497033081949
Epoch 34 MSE: 0.0010084948735311627
Epoch 35 MSE: 0.0011262957705184817
Epoch 36 MSE: 0.0006711000460200012
Epoch 37 MSE: 0.00030652631539851427
Epoch 38 MSE: 0.00036679531331174076
Epoch 39 MSE: 0.0004772660613525659
Epoch 40 MSE: 0.0003588088438846171
Epoch 41 MSE: 0.0002317993639735505
Epoch 42 MSE: 0.00031189745641313493
Epoch 43 MSE: 0.00047573435585945845
Epoch 44 MSE: 0.0004970458685420454
Epoch 45 MSE: 0.0003521016624290496
Epoch 46 MSE: 0.00021478749113157392
Epoch 47 MSE: 0.00020799481717403978
Epoch 48 MSE: 0.0002479048853274435
Epoch 49 MSE: 0.0002076068049063906

Epoch	50	MSE:	0.00013809588563162833
Epoch	51	MSE:	0.00016069348203018308
Epoch	52	MSE:	0.00024086135090328753
Epoch	53	MSE:	0.00025066183297894895
Epoch	54	MSE:	0.00017975617083720863
Epoch	55	MSE:	0.00013152843166608363
Epoch	56	MSE:	0.000144060657476075
Epoch	57	MSE:	0.00015148622333072126
Epoch	58	MSE:	0.00012229193816892803
Epoch	59	MSE:	0.00010617181396810338
Epoch	60	MSE:	0.00013087761180941015
Epoch	61	MSE:	0.00015543207700829953
Epoch	62	MSE:	0.00014234526315703988
Epoch	63	MSE:	0.00011258694576099515
Epoch	64	MSE:	0.00010384424967924133
Epoch	65	MSE:	0.00011075801739934832
Epoch	66	MSE:	0.00010466326784808189
Epoch	67	MSE:	8.986319153336808e-05
Epoch	68	MSE:	9.183560177916661e-05
Epoch	69	MSE:	0.00010631137411110103
Epoch	70	MSE:	0.000107503954495769
Epoch	71	MSE:	9.400263661518693e-05
Epoch	72	MSE:	8.654740668134764e-05
Epoch	73	MSE:	8.906482253223658e-05
Epoch	74	MSE:	8.727735985303298e-05
Epoch	75	MSE:	7.996119529707357e-05
Epoch	76	MSE:	7.928680861368775e-05
Epoch	77	MSE:	8.530687046004459e-05
Epoch	78	MSE:	8.632442040834576e-05
Epoch	79	MSE:	8.036888903006911e-05
Epoch	80	MSE:	7.650337647646666e-05
Epoch	81	MSE:	7.714644016232342e-05
Epoch	82	MSE:	7.589531742269173e-05
Epoch	83	MSE:	7.206238660728559e-05
Epoch	84	MSE:	7.153757906053215e-05
Epoch	85	MSE:	7.407956582028419e-05
Epoch	86	MSE:	7.385374919977039e-05
Epoch	87	MSE:	7.069738785503432e-05
Epoch	88	MSE:	6.917108112247661e-05
Epoch	89	MSE:	6.924908666405827e-05
Epoch	90	MSE:	6.782602577004582e-05
Epoch	91	MSE:	6.590679549844936e-05
Epoch	92	MSE:	6.60521982354112e-05
Epoch	93	MSE:	6.679696525679901e-05
Epoch	94	MSE:	6.5775187977124e-05
Epoch	95	MSE:	6.41608057776466e-05
Epoch	96	MSE:	6.365749868564308e-05
Epoch	97	MSE:	6.32236260571517e-05

Epoch 98 MSE: 6.196780304890126e-05
Epoch 99 MSE: 6.11766881775111e-05
T-time: 35.99884629249573

=====

Train Score: 0.23 RMSE

=====

Validation Score: 6.17 RMSE

=====

Epoch 0 MSE: 0.08047892898321152
Epoch 1 MSE: 0.03562302514910698
Epoch 2 MSE: 0.05121961608529091
Epoch 3 MSE: 0.041620392352342606
Epoch 4 MSE: 0.03336156904697418
Epoch 5 MSE: 0.031205272302031517
Epoch 6 MSE: 0.03137967362999916
Epoch 7 MSE: 0.031087026000022888
Epoch 8 MSE: 0.028986413031816483
Epoch 9 MSE: 0.02530658431351185
Epoch 10 MSE: 0.021906539797782898
Epoch 11 MSE: 0.020436305552721024
Epoch 12 MSE: 0.020154934376478195
Epoch 13 MSE: 0.014199442230165005
Epoch 14 MSE: 0.008553585968911648
Epoch 15 MSE: 0.005487404763698578
Epoch 16 MSE: 0.0029131711926311255
Epoch 17 MSE: 0.00039877466042526066
Epoch 18 MSE: 0.0050320071168243885
Epoch 19 MSE: 0.00418497808277607
Epoch 20 MSE: 0.00305158575065434
Epoch 21 MSE: 0.004048240836709738
Epoch 22 MSE: 0.003274116665124893
Epoch 23 MSE: 0.0012034106766805053
Epoch 24 MSE: 0.0003953959094360471
Epoch 25 MSE: 0.002078538527712226
Epoch 26 MSE: 0.0024147029034793377
Epoch 27 MSE: 0.0011171953519806266
Epoch 28 MSE: 0.0010551209561526775
Epoch 29 MSE: 0.0016763875028118491
Epoch 30 MSE: 0.001685582916252315
Epoch 31 MSE: 0.0009498797589913011
Epoch 32 MSE: 0.000249645410804078
Epoch 33 MSE: 0.0004046301473863423
Epoch 34 MSE: 0.000943748455028981
Epoch 35 MSE: 0.0007043899386189878
Epoch 36 MSE: 0.0002134292444679886
Epoch 37 MSE: 0.00031716644298285246

Epoch 38 MSE: 0.0006371757481247187
Epoch 39 MSE: 0.0005717662279494107
Epoch 40 MSE: 0.00021057750564068556
Epoch 41 MSE: 9.886403859127313e-05
Epoch 42 MSE: 0.0004011958371847868
Epoch 43 MSE: 0.0004362800973467529
Epoch 44 MSE: 0.00017060154641512781
Epoch 45 MSE: 0.00013747152115684003
Epoch 46 MSE: 0.000313637254294008
Epoch 47 MSE: 0.0003149867698084563
Epoch 48 MSE: 0.00013133428001310676
Epoch 49 MSE: 8.537665416952223e-05
Epoch 50 MSE: 0.00022125622490420938
Epoch 51 MSE: 0.00022161535162013024
Epoch 52 MSE: 9.578822209732607e-05
Epoch 53 MSE: 0.00010838986054295674
Epoch 54 MSE: 0.00018704407557379454
Epoch 55 MSE: 0.00015526331844739616
Epoch 56 MSE: 7.055028254399076e-05
Epoch 57 MSE: 8.946970774559304e-05
Epoch 58 MSE: 0.00014515500515699387
Epoch 59 MSE: 0.00010888940596487373
Epoch 60 MSE: 6.465918704634532e-05
Epoch 61 MSE: 9.459044667892158e-05
Epoch 62 MSE: 0.00011465025454526767
Epoch 63 MSE: 7.543915853602812e-05
Epoch 64 MSE: 5.509005859494209e-05
Epoch 65 MSE: 8.436258940491825e-05
Epoch 66 MSE: 8.586446347180754e-05
Epoch 67 MSE: 5.586202678387053e-05
Epoch 68 MSE: 5.92572869209107e-05
Epoch 69 MSE: 7.564842962892726e-05
Epoch 70 MSE: 6.230369035620242e-05
Epoch 71 MSE: 4.50704428658355e-05
Epoch 72 MSE: 5.596560731646605e-05
Epoch 73 MSE: 6.16850666119717e-05
Epoch 74 MSE: 4.629918475984596e-05
Epoch 75 MSE: 4.4542270188685507e-05
Epoch 76 MSE: 5.342414806364104e-05
Epoch 77 MSE: 4.765593257616274e-05
Epoch 78 MSE: 3.84728737117257e-05
Epoch 79 MSE: 4.3199805077165365e-05
Epoch 80 MSE: 4.61791169072967e-05
Epoch 81 MSE: 3.8486436096718535e-05
Epoch 82 MSE: 3.696620842674747e-05
Epoch 83 MSE: 4.124195402255282e-05
Epoch 84 MSE: 3.8417212635977194e-05
Epoch 85 MSE: 3.354704676894471e-05

Epoch 86 MSE: 3.58863799192477e-05
Epoch 87 MSE: 3.6870962503599e-05
Epoch 88 MSE: 3.254369585192762e-05
Epoch 89 MSE: 3.234448013245128e-05
Epoch 90 MSE: 3.415054379729554e-05
Epoch 91 MSE: 3.1600276997778565e-05
Epoch 92 MSE: 2.9754646675428376e-05
Epoch 93 MSE: 3.132691927021369e-05
Epoch 94 MSE: 3.033577922906261e-05
Epoch 95 MSE: 2.8197016945341602e-05
Epoch 96 MSE: 2.8909140382893384e-05
Epoch 97 MSE: 2.869442141673062e-05
Epoch 98 MSE: 2.678702730918303e-05
Epoch 99 MSE: 2.6934707420878112e-05
T-time: 37.408742904663086

=====
Train Score: 0.15 RMSE
=====
Validation Score: 1.07 RMSE
=====

=====
Time Step = 100 | Hidden States = 2 | Num Layers = 1
=====

Epoch 0 MSE: 0.31130993366241455
Epoch 1 MSE: 0.27421465516090393
Epoch 2 MSE: 0.23992273211479187
Epoch 3 MSE: 0.20845869183540344
Epoch 4 MSE: 0.17979489266872406
Epoch 5 MSE: 0.15385624766349792
Epoch 6 MSE: 0.1305287629365921
Epoch 7 MSE: 0.10967273265123367
Epoch 8 MSE: 0.09113913029432297
Epoch 9 MSE: 0.07478595525026321
Epoch 10 MSE: 0.06049126759171486
Epoch 11 MSE: 0.04815917834639549
Epoch 12 MSE: 0.03771792724728584
Epoch 13 MSE: 0.029111096635460854
Epoch 14 MSE: 0.022284315899014473
Epoch 15 MSE: 0.017170190811157227
Epoch 16 MSE: 0.01367371529340744
Epoch 17 MSE: 0.011659832671284676
Epoch 18 MSE: 0.010944748297333717
Epoch 19 MSE: 0.011292870156466961
Epoch 20 MSE: 0.012421810999512672
Epoch 21 MSE: 0.014017540030181408

Epoch	22	MSE:	0.015759699046611786
Epoch	23	MSE:	0.01735352911055088
Epoch	24	MSE:	0.018561623990535736
Epoch	25	MSE:	0.019227318465709686
Epoch	26	MSE:	0.01928420178592205
Epoch	27	MSE:	0.018750576302409172
Epoch	28	MSE:	0.01771208830177784
Epoch	29	MSE:	0.016298076137900352
Epoch	30	MSE:	0.014656894840300083
Epoch	31	MSE:	0.012934413738548756
Epoch	32	MSE:	0.011257749982178211
Epoch	33	MSE:	0.009725207462906837
Epoch	34	MSE:	0.008401994593441486
Epoch	35	MSE:	0.007320776581764221
Epoch	36	MSE:	0.006485709920525551
Epoch	37	MSE:	0.0058784945867955685
Epoch	38	MSE:	0.005465253256261349
Epoch	39	MSE:	0.005203173030167818
Epoch	40	MSE:	0.0050463443621993065
Epoch	41	MSE:	0.004950386937707663
Epoch	42	MSE:	0.004875833168625832
Epoch	43	MSE:	0.004790322855114937
Epoch	44	MSE:	0.004669769201427698
Epoch	45	MSE:	0.004498705733567476
Epoch	46	MSE:	0.004269980825483799
Epoch	47	MSE:	0.003983984235674143
Epoch	48	MSE:	0.0036474913358688354
Epoch	49	MSE:	0.0032722854521125555
Epoch	50	MSE:	0.0028735927771776915
Epoch	51	MSE:	0.0024684465024620295
Epoch	52	MSE:	0.0020740439649671316
Epoch	53	MSE:	0.0017062078695744276
Epoch	54	MSE:	0.001378013868816197
Epoch	55	MSE:	0.0010987466666847467
Epoch	56	MSE:	0.0008732251008041203
Epoch	57	MSE:	0.0007016073213890195
Epoch	58	MSE:	0.0005796948098577559
Epoch	59	MSE:	0.0004997187061235309
Epoch	60	MSE:	0.0004515133914537728
Epoch	61	MSE:	0.0004239282861817628
Epoch	62	MSE:	0.00040627000271342695
Epoch	63	MSE:	0.00038957371725700796
Epoch	64	MSE:	0.0003675157786346972
Epoch	65	MSE:	0.00033684392110444605
Epoch	66	MSE:	0.0002973076479975134
Epoch	67	MSE:	0.0002511347702238709
Epoch	68	MSE:	0.00020219976431690156
Epoch	69	MSE:	0.0001550565066281706

```

Epoch 70 MSE: 0.00011400931543903425
Epoch 71 MSE: 8.23729278636165e-05
Epoch 72 MSE: 6.201089854585007e-05
Epoch 73 MSE: 5.318405601428822e-05
Epoch 74 MSE: 5.468396557262167e-05
Epoch 75 MSE: 6.41763472231105e-05
Epoch 76 MSE: 7.867264503147453e-05
Epoch 77 MSE: 9.502915781922638e-05
Epoch 78 MSE: 0.00011039745004381984
Epoch 79 MSE: 0.0001225639571202919
Epoch 80 MSE: 0.00013014728028792888
Epoch 81 MSE: 0.00013264558219816536
Epoch 82 MSE: 0.00013035559095442295
Epoch 83 MSE: 0.00012418815458659083
Epoch 84 MSE: 0.00011542721767909825
Epoch 85 MSE: 0.00010547332203714177
Epoch 86 MSE: 9.561496699461713e-05
Epoch 87 MSE: 8.685351349413395e-05
Epoch 88 MSE: 7.980271038832143e-05
Epoch 89 MSE: 7.466681563528255e-05
Epoch 90 MSE: 7.12895198375918e-05
Epoch 91 MSE: 6.925132765900344e-05
Epoch 92 MSE: 6.799675611546263e-05
Epoch 93 MSE: 6.69612709316425e-05
Epoch 94 MSE: 6.567749369423836e-05
Epoch 95 MSE: 6.384588778018951e-05
Epoch 96 MSE: 6.136255251476541e-05
Epoch 97 MSE: 5.830674490425736e-05
Epoch 98 MSE: 5.4896179790375754e-05
Epoch 99 MSE: 5.1424893172224984e-05
T-time: 11.552145719528198

```

```

=====
Train Score: 0.21 RMSE
=====
Validation Score: 7.47 RMSE
=====

```

```

Epoch 0 MSE: 0.38213953375816345
Epoch 1 MSE: 0.35144129395484924
Epoch 2 MSE: 0.3233320116996765
Epoch 3 MSE: 0.2976057529449463
Epoch 4 MSE: 0.27401798963546753
Epoch 5 MSE: 0.25236770510673523
Epoch 6 MSE: 0.23246948421001434
Epoch 7 MSE: 0.2141793668270111
Epoch 8 MSE: 0.19736449420452118
Epoch 9 MSE: 0.18190303444862366

```

Epoch	10	MSE:	0.16768811643123627
Epoch	11	MSE:	0.15462279319763184
Epoch	12	MSE:	0.1426173597574234
Epoch	13	MSE:	0.13158784806728363
Epoch	14	MSE:	0.12145599722862244
Epoch	15	MSE:	0.11225192248821259
Epoch	16	MSE:	0.10658346116542816
Epoch	17	MSE:	0.1016140878200531
Epoch	18	MSE:	0.09705814719200134
Epoch	19	MSE:	0.09280640631914139
Epoch	20	MSE:	0.08880883455276489
Epoch	21	MSE:	0.08503402024507523
Epoch	22	MSE:	0.08145006746053696
Epoch	23	MSE:	0.07802945375442505
Epoch	24	MSE:	0.0747564509510994
Epoch	25	MSE:	0.07161495089530945
Epoch	26	MSE:	0.06859196722507477
Epoch	27	MSE:	0.06567669659852982
Epoch	28	MSE:	0.06285455077886581
Epoch	29	MSE:	0.06010740250349045
Epoch	30	MSE:	0.057422105222940445
Epoch	31	MSE:	0.054782308638095856
Epoch	32	MSE:	0.052171409130096436
Epoch	33	MSE:	0.04958019033074379
Epoch	34	MSE:	0.04700253903865814
Epoch	35	MSE:	0.04443146288394928
Epoch	36	MSE:	0.04186450317502022
Epoch	37	MSE:	0.03930674120783806
Epoch	38	MSE:	0.0367712639272213
Epoch	39	MSE:	0.0342831052839756
Epoch	40	MSE:	0.031899116933345795
Epoch	41	MSE:	0.029677240177989006
Epoch	42	MSE:	0.02830512262880802
Epoch	43	MSE:	0.027010073885321617
Epoch	44	MSE:	0.025087477639317513
Epoch	45	MSE:	0.022673984989523888
Epoch	46	MSE:	0.020731648430228233
Epoch	47	MSE:	0.019174724817276
Epoch	48	MSE:	0.017719663679599762
Epoch	49	MSE:	0.016343990340828896
Epoch	50	MSE:	0.015051232650876045
Epoch	51	MSE:	0.013850370422005653
Epoch	52	MSE:	0.012750299647450447
Epoch	53	MSE:	0.011763341724872589
Epoch	54	MSE:	0.010896708816289902
Epoch	55	MSE:	0.010144619271159172
Epoch	56	MSE:	0.00948413647711277
Epoch	57	MSE:	0.008878529071807861

Epoch 58 MSE: 0.008291804231703281
 Epoch 59 MSE: 0.007706875912845135
 Epoch 60 MSE: 0.007131569087505341
 Epoch 61 MSE: 0.006588226184248924
 Epoch 62 MSE: 0.006098412908613682
 Epoch 63 MSE: 0.005670612677931786
 Epoch 64 MSE: 0.005298968404531479
 Epoch 65 MSE: 0.004967529326677322
 Epoch 66 MSE: 0.004657682962715626
 Epoch 67 MSE: 0.004354986362159252
 Epoch 68 MSE: 0.004052917007356882
 Epoch 69 MSE: 0.003752906108275056
 Epoch 70 MSE: 0.0034613267052918673
 Epoch 71 MSE: 0.0031872084364295006
 Epoch 72 MSE: 0.0029362263157963753
 Epoch 73 MSE: 0.002711189677938819
 Epoch 74 MSE: 0.002507824217900634
 Epoch 75 MSE: 0.0023167601320892572
 Epoch 76 MSE: 0.002129256958141923
 Epoch 77 MSE: 0.0019419969758018851
 Epoch 78 MSE: 0.0017592828953638673
 Epoch 79 MSE: 0.0015875479439273477
 Epoch 80 MSE: 0.0014308353420346975
 Epoch 81 MSE: 0.0012905445182695985
 Epoch 82 MSE: 0.0011650846572592854
 Epoch 83 MSE: 0.0010514076566323638
 Epoch 84 MSE: 0.0009470827644690871
 Epoch 85 MSE: 0.0008507657330483198
 Epoch 86 MSE: 0.0007627673912793398
 Epoch 87 MSE: 0.0006849058554507792
 Epoch 88 MSE: 0.0006183628574945033
 Epoch 89 MSE: 0.0005672789411619306
 Epoch 90 MSE: 0.0005583598976954818
 Epoch 91 MSE: 0.0005488929455168545
 Epoch 92 MSE: 0.0005068129394203424
 Epoch 93 MSE: 0.0004472823056858033
 Epoch 94 MSE: 0.0003993050195276737
 Epoch 95 MSE: 0.00037672827602364123
 Epoch 96 MSE: 0.00036208820529282093
 Epoch 97 MSE: 0.0003380415728315711
 Epoch 98 MSE: 0.0003042609023395926
 Epoch 99 MSE: 0.000268508680164814
 T-time: 10.04958462715149

=====
 Train Score: 0.49 RMSE
 =====
 Validation Score: 1.16 RMSE

=====

=====

Time Step = 100 | Hidden States = 2 | Num Layers = 2

=====

Epoch	0	MSE:	0.3231036067008972
Epoch	1	MSE:	0.2798193693161011
Epoch	2	MSE:	0.24110744893550873
Epoch	3	MSE:	0.20657718181610107
Epoch	4	MSE:	0.1755928248167038
Epoch	5	MSE:	0.14752012491226196
Epoch	6	MSE:	0.12202993035316467
Epoch	7	MSE:	0.09912478178739548
Epoch	8	MSE:	0.07900048792362213
Epoch	9	MSE:	0.06192374229431152
Epoch	10	MSE:	0.0481487400829792
Epoch	11	MSE:	0.03785112872719765
Epoch	12	MSE:	0.031068820506334305
Epoch	13	MSE:	0.027649613097310066
Epoch	14	MSE:	0.027213839814066887
Epoch	15	MSE:	0.029145503416657448
Epoch	16	MSE:	0.032630011439323425
Epoch	17	MSE:	0.03675312548875809
Epoch	18	MSE:	0.040650054812431335
Epoch	19	MSE:	0.0436527356505394
Epoch	20	MSE:	0.045373208820819855
Epoch	21	MSE:	0.04570326954126358
Epoch	22	MSE:	0.044757530093193054
Epoch	23	MSE:	0.042796891182661057
Epoch	24	MSE:	0.04015588015317917
Epoch	25	MSE:	0.03718293458223343
Epoch	26	MSE:	0.0341956727206707
Epoch	27	MSE:	0.03145082667469978
Epoch	28	MSE:	0.02912789210677147
Epoch	29	MSE:	0.027325192466378212
Epoch	30	MSE:	0.026066306978464127
Epoch	31	MSE:	0.025313779711723328
Epoch	32	MSE:	0.024986738339066505
Epoch	33	MSE:	0.02497916668653488
Epoch	34	MSE:	0.025176361203193665
Epoch	35	MSE:	0.025468075647950172
Epoch	36	MSE:	0.025757931172847748
Epoch	37	MSE:	0.02596917375922203
Epoch	38	MSE:	0.026047417894005775
Epoch	39	MSE:	0.025960922241210938
Epoch	40	MSE:	0.025699123740196228
Epoch	41	MSE:	0.025269871577620506

Epoch 42 MSE: 0.02469577081501484
Epoch 43 MSE: 0.02400997094810009
Epoch 44 MSE: 0.023251712322235107
Epoch 45 MSE: 0.022461799904704094
Epoch 46 MSE: 0.021678339689970016
Epoch 47 MSE: 0.020932991057634354
Epoch 48 MSE: 0.020248031243681908
Epoch 49 MSE: 0.01963450200855732
Epoch 50 MSE: 0.01909170113503933
Epoch 51 MSE: 0.018608078360557556
Epoch 52 MSE: 0.018163517117500305
Epoch 53 MSE: 0.01773274876177311
Epoch 54 MSE: 0.017289424315094948
Epoch 55 MSE: 0.016810258850455284
Epoch 56 MSE: 0.016278641298413277
Epoch 57 MSE: 0.015687044709920883
Epoch 58 MSE: 0.015037915669381618
Epoch 59 MSE: 0.01434286031872034
Epoch 60 MSE: 0.01362033374607563
Epoch 61 MSE: 0.012892238795757294
Epoch 62 MSE: 0.012180055491626263
Epoch 63 MSE: 0.011501159518957138
Epoch 64 MSE: 0.010865993797779083
Epoch 65 MSE: 0.01027659047394991
Epoch 66 MSE: 0.009726730175316334
Epoch 67 MSE: 0.009203776717185974
Epoch 68 MSE: 0.008691933006048203
Epoch 69 MSE: 0.008176315575838089
Epoch 70 MSE: 0.007647012360394001
Epoch 71 MSE: 0.007102194242179394
Epoch 72 MSE: 0.006549294572323561
Epoch 73 MSE: 0.006003798916935921
Epoch 74 MSE: 0.005485672038048506
Epoch 75 MSE: 0.005014200694859028
Epoch 76 MSE: 0.004602789878845215
Epoch 77 MSE: 0.004255484789609909
Epoch 78 MSE: 0.003966679330915213
Epoch 79 MSE: 0.0037244190461933613
Epoch 80 MSE: 0.0035161259584128857
Epoch 81 MSE: 0.003334234468638897
Epoch 82 MSE: 0.003178861690685153
Epoch 83 MSE: 0.0030558824073523283
Epoch 84 MSE: 0.002971191890537739
Epoch 85 MSE: 0.002924405038356781
Epoch 86 MSE: 0.0029060232918709517
Epoch 87 MSE: 0.0029003273230046034
Epoch 88 MSE: 0.0028924790676683187
Epoch 89 MSE: 0.002875141566619277

Epoch 90 MSE: 0.00285010295920074
Epoch 91 MSE: 0.0028240180108696222
Epoch 92 MSE: 0.002801730763167143
Epoch 93 MSE: 0.0027820635586977005
Epoch 94 MSE: 0.002758714836090803
Epoch 95 MSE: 0.002724909922108054
Epoch 96 MSE: 0.0026779905892908573
Epoch 97 MSE: 0.0026207806076854467
Epoch 98 MSE: 0.0025592967867851257
Epoch 99 MSE: 0.00249895709566772
T-time: 21.409639358520508

=====
Train Score: 1.49 RMSE
=====
Validation Score: 19.25 RMSE
=====

Epoch 0 MSE: 0.2989099621772766
Epoch 1 MSE: 0.2629437744617462
Epoch 2 MSE: 0.22735147178173065
Epoch 3 MSE: 0.19234834611415863
Epoch 4 MSE: 0.15830309689044952
Epoch 5 MSE: 0.1255970001220703
Epoch 6 MSE: 0.09466824680566788
Epoch 7 MSE: 0.065078005194664
Epoch 8 MSE: 0.038183361291885376
Epoch 9 MSE: 0.017039626836776733
Epoch 10 MSE: 0.0038898405618965626
Epoch 11 MSE: 0.0014080700930207968
Epoch 12 MSE: 0.01072473544627428
Epoch 13 MSE: 0.025184214115142822
Epoch 14 MSE: 0.03407096490263939
Epoch 15 MSE: 0.034596022218465805
Epoch 16 MSE: 0.02931850589811802
Epoch 17 MSE: 0.02180331200361252
Epoch 18 MSE: 0.014627210795879364
Epoch 19 MSE: 0.009101135656237602
Epoch 20 MSE: 0.005634289234876633
Epoch 21 MSE: 0.004059221129864454
Epoch 22 MSE: 0.003945270553231239
Epoch 23 MSE: 0.0047954292967915535
Epoch 24 MSE: 0.006136258598417044
Epoch 25 MSE: 0.007569550536572933
Epoch 26 MSE: 0.008758001029491425
Epoch 27 MSE: 0.009565846063196659
Epoch 28 MSE: 0.009956233203411102
Epoch 29 MSE: 0.009939318522810936

Epoch	30	MSE:	0.009562346152961254
Epoch	31	MSE:	0.008899923413991928
Epoch	32	MSE:	0.008043266832828522
Epoch	33	MSE:	0.007090174127370119
Epoch	34	MSE:	0.0061353701166808605
Epoch	35	MSE:	0.005261472426354885
Epoch	36	MSE:	0.004531115759164095
Epoch	37	MSE:	0.003981894347816706
Epoch	38	MSE:	0.0036231211852282286
Epoch	39	MSE:	0.0034374480601400137
Epoch	40	MSE:	0.0033843154087662697
Epoch	41	MSE:	0.003405868075788021
Epoch	42	MSE:	0.003440670669078827
Epoch	43	MSE:	0.003446929156780243
Epoch	44	MSE:	0.0034053418785333633
Epoch	45	MSE:	0.0032485199626535177
Epoch	46	MSE:	0.002952347043901682
Epoch	47	MSE:	0.0025444156490266323
Epoch	48	MSE:	0.002086368855088949
Epoch	49	MSE:	0.001646149205043912
Epoch	50	MSE:	0.0012789614265784621
Epoch	51	MSE:	0.0010115428594872355
Epoch	52	MSE:	0.0008353409357368946
Epoch	53	MSE:	0.0007302591111510992
Epoch	54	MSE:	0.0006723947590216994
Epoch	55	MSE:	0.0006366583984345198
Epoch	56	MSE:	0.0006013476522639394
Epoch	57	MSE:	0.0005514115327969193
Epoch	58	MSE:	0.0004806823271792382
Epoch	59	MSE:	0.0003916265850421041
Epoch	60	MSE:	0.0002930876216851175
Epoch	61	MSE:	0.00019853322010021657
Epoch	62	MSE:	0.00012411434727255255
Epoch	63	MSE:	8.22544316179119e-05
Epoch	64	MSE:	7.768682553432882e-05
Epoch	65	MSE:	0.00010421320621389896
Epoch	66	MSE:	0.00014745525550097227
Epoch	67	MSE:	0.0001902407529996708
Epoch	68	MSE:	0.00021834119979757816
Epoch	69	MSE:	0.0002248344972031191
Epoch	70	MSE:	0.00021138580632396042
Epoch	71	MSE:	0.000186136006959714
Epoch	72	MSE:	0.00015956239076331258
Epoch	73	MSE:	0.00014017615467309952
Epoch	74	MSE:	0.00013182336988393217
Epoch	75	MSE:	0.00013320728612598032
Epoch	76	MSE:	0.00013940293865744025
Epoch	77	MSE:	0.00014439098595175892

```
Epoch 78 MSE: 0.00014346567331813276
Epoch 79 MSE: 0.00013475253945216537
Epoch 80 MSE: 0.00011945460573770106
Epoch 81 MSE: 0.00010100200597662479
Epoch 82 MSE: 8.355112368008122e-05
Epoch 83 MSE: 7.047559483908117e-05
Epoch 84 MSE: 6.333713827189058e-05
Epoch 85 MSE: 6.163550278870389e-05
Epoch 86 MSE: 6.332021439447999e-05
Epoch 87 MSE: 6.577063322765753e-05
Epoch 88 MSE: 6.683027459075674e-05
Epoch 89 MSE: 6.54886825941503e-05
Epoch 90 MSE: 6.201995711307973e-05
Epoch 91 MSE: 5.760356361861341e-05
Epoch 92 MSE: 5.3699968702858314e-05
Epoch 93 MSE: 5.1405539124971256e-05
Epoch 94 MSE: 5.108871482661925e-05
Epoch 95 MSE: 5.234957643551752e-05
Epoch 96 MSE: 5.428643271443434e-05
Epoch 97 MSE: 5.591213994193822e-05
Epoch 98 MSE: 5.651186074828729e-05
Epoch 99 MSE: 5.5857959523564205e-05
T-time: 19.064570903778076
```

```
=====
Train Score: 0.22 RMSE
=====
Validation Score: 1.19 RMSE
=====
```

```
=====
Time Step = 100 | Hidden States = 4 | Num Layers = 1
=====
```

```
Epoch 0 MSE: 0.13147138059139252
Epoch 1 MSE: 0.09974874556064606
Epoch 2 MSE: 0.07940835505723953
Epoch 3 MSE: 0.06796365231275558
Epoch 4 MSE: 0.06272579729557037
Epoch 5 MSE: 0.061060693114995956
Epoch 6 MSE: 0.060731299221515656
Epoch 7 MSE: 0.0602140799164772
Epoch 8 MSE: 0.058787066489458084
Epoch 9 MSE: 0.05636468902230263
Epoch 10 MSE: 0.05323122441768646
Epoch 11 MSE: 0.04981053248047829
Epoch 12 MSE: 0.046514611691236496
Epoch 13 MSE: 0.04365834966301918
```

Epoch	14	MSE:	0.041419826447963715
Epoch	15	MSE:	0.03983239084482193
Epoch	16	MSE:	0.03880184516310692
Epoch	17	MSE:	0.0381438210606575
Epoch	18	MSE:	0.037634462118148804
Epoch	19	MSE:	0.03706352785229683
Epoch	20	MSE:	0.036277540028095245
Epoch	21	MSE:	0.03520350903272629
Epoch	22	MSE:	0.033850591629743576
Epoch	23	MSE:	0.03229374811053276
Epoch	24	MSE:	0.030646737664937973
Epoch	25	MSE:	0.02903159148991108
Epoch	26	MSE:	0.027550015598535538
Epoch	27	MSE:	0.026260899379849434
Epoch	28	MSE:	0.025167999789118767
Epoch	29	MSE:	0.02422153204679489
Epoch	30	MSE:	0.023335324600338936
Epoch	31	MSE:	0.022415611892938614
Epoch	32	MSE:	0.02139182947576046
Epoch	33	MSE:	0.020237628370523453
Epoch	34	MSE:	0.01897515542805195
Epoch	35	MSE:	0.017662981525063515
Epoch	36	MSE:	0.01637345924973488
Epoch	37	MSE:	0.01516722422093153
Epoch	38	MSE:	0.014072366990149021
Epoch	39	MSE:	0.013074779883027077
Epoch	40	MSE:	0.012124111875891685
Epoch	41	MSE:	0.011155516840517521
Epoch	42	MSE:	0.010119888931512833
Epoch	43	MSE:	0.009008672088384628
Epoch	44	MSE:	0.007859895005822182
Epoch	45	MSE:	0.006741470657289028
Epoch	46	MSE:	0.0057190642692148685
Epoch	47	MSE:	0.004823789000511169
Epoch	48	MSE:	0.00403817230835557
Epoch	49	MSE:	0.0033129879739135504
Epoch	50	MSE:	0.0026077658403664827
Epoch	51	MSE:	0.0019262159476056695
Epoch	52	MSE:	0.0013189006131142378
Epoch	53	MSE:	0.0008493505301885307
Epoch	54	MSE:	0.0005456316866911948
Epoch	55	MSE:	0.000375046074623242
Epoch	56	MSE:	0.0002719303302001208
Epoch	57	MSE:	0.0001996740757022053
Epoch	58	MSE:	0.00017975049559026957
Epoch	59	MSE:	0.0002513598883524537
Epoch	60	MSE:	0.00040645175613462925
Epoch	61	MSE:	0.0005781119107268751

```

Epoch 62 MSE: 0.0007011781563051045
Epoch 63 MSE: 0.0007698960253037512
Epoch 64 MSE: 0.0008206527563743293
Epoch 65 MSE: 0.0008690363611094654
Epoch 66 MSE: 0.0008865189156495035
Epoch 67 MSE: 0.0008433662005700171
Epoch 68 MSE: 0.0007514083990827203
Epoch 69 MSE: 0.0006495376583188772
Epoch 70 MSE: 0.0005607811035588384
Epoch 71 MSE: 0.0004781677562277764
Epoch 72 MSE: 0.0003887093917001039
Epoch 73 MSE: 0.00029740273021161556
Epoch 74 MSE: 0.0002225721109425649
Epoch 75 MSE: 0.00017498056695330888
Epoch 76 MSE: 0.00014862501120660454
Epoch 77 MSE: 0.00013100987416692078
Epoch 78 MSE: 0.0001170800969703123
Epoch 79 MSE: 0.00011089711188105866
Epoch 80 MSE: 0.00011658610310405493
Epoch 81 MSE: 0.00013117444177623838
Epoch 82 MSE: 0.00014677885337732732
Epoch 83 MSE: 0.00015789673489052802
Epoch 84 MSE: 0.00016501008940394968
Epoch 85 MSE: 0.0001714718237053603
Epoch 86 MSE: 0.00017834585742093623
Epoch 87 MSE: 0.00018307770369574428
Epoch 88 MSE: 0.0001826854277169332
Epoch 89 MSE: 0.0001771689421730116
Epoch 90 MSE: 0.00016931808204390109
Epoch 91 MSE: 0.00016164779663085938
Epoch 92 MSE: 0.00015424584853462875
Epoch 93 MSE: 0.0001457423495594412
Epoch 94 MSE: 0.000135783149744384
Epoch 95 MSE: 0.00012590715778060257
Epoch 96 MSE: 0.00011800262291217223
Epoch 97 MSE: 0.00011245893983868882
Epoch 98 MSE: 0.00010822879266925156
Epoch 99 MSE: 0.00010446419764775783
T-time: 10.28565502166748

```

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=====
Train Score: 0.30 RMSE
=====
Validation Score: 10.34 RMSE
=====

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```

Epoch 0 MSE: 0.11859618127346039
Epoch 1 MSE: 0.1084759458899498

```

Epoch 2 MSE: 0.09930511564016342
Epoch 3 MSE: 0.09087906777858734
Epoch 4 MSE: 0.08320387452840805
Epoch 5 MSE: 0.07632068544626236
Epoch 6 MSE: 0.07029535621404648
Epoch 7 MSE: 0.06513529270887375
Epoch 8 MSE: 0.06089991703629494
Epoch 9 MSE: 0.057629842311143875
Epoch 10 MSE: 0.055306289345026016
Epoch 11 MSE: 0.05379191413521767
Epoch 12 MSE: 0.05283217877149582
Epoch 13 MSE: 0.05217231437563896
Epoch 14 MSE: 0.05162941664457321
Epoch 15 MSE: 0.05108548328280449
Epoch 16 MSE: 0.0504717193543911
Epoch 17 MSE: 0.04975840449333191
Epoch 18 MSE: 0.04894590750336647
Epoch 19 MSE: 0.04805551469326019
Epoch 20 MSE: 0.04712037742137909
Epoch 21 MSE: 0.04617774114012718
Epoch 22 MSE: 0.0452628917992115
Epoch 23 MSE: 0.04440508410334587
Epoch 24 MSE: 0.04362529516220093
Epoch 25 MSE: 0.042935557663440704
Epoch 26 MSE: 0.042339444160461426
Epoch 27 MSE: 0.04183335602283478
Epoch 28 MSE: 0.04140825569629669
Epoch 29 MSE: 0.04105153679847717
Epoch 30 MSE: 0.04074880853295326
Epoch 31 MSE: 0.04048547521233559
Epoch 32 MSE: 0.04024796560406685
Epoch 33 MSE: 0.04002469405531883
Epoch 34 MSE: 0.03980650007724762
Epoch 35 MSE: 0.039586976170539856
Epoch 36 MSE: 0.0393623523414135
Epoch 37 MSE: 0.039131246507167816
Epoch 38 MSE: 0.038894277065992355
Epoch 39 MSE: 0.03865355625748634
Epoch 40 MSE: 0.038412123918533325
Epoch 41 MSE: 0.03817346692085266
Epoch 42 MSE: 0.037941016256809235
Epoch 43 MSE: 0.03771776705980301
Epoch 44 MSE: 0.03750596195459366
Epoch 45 MSE: 0.037306930869817734
Epoch 46 MSE: 0.0371210053563118
Epoch 47 MSE: 0.0369475856423378
Epoch 48 MSE: 0.03678525611758232
Epoch 49 MSE: 0.036632005125284195

Epoch	50	MSE:	0.03648550063371658
Epoch	51	MSE:	0.03634331375360489
Epoch	52	MSE:	0.036203205585479736
Epoch	53	MSE:	0.036063291132450104
Epoch	54	MSE:	0.03592216223478317
Epoch	55	MSE:	0.03577895835042
Epoch	56	MSE:	0.035633333027362823
Epoch	57	MSE:	0.03548534959554672
Epoch	58	MSE:	0.03533539921045303
Epoch	59	MSE:	0.035184022039175034
Epoch	60	MSE:	0.03503178805112839
Epoch	61	MSE:	0.034879159182310104
Epoch	62	MSE:	0.03472642973065376
Epoch	63	MSE:	0.03457362949848175
Epoch	64	MSE:	0.03442058712244034
Epoch	65	MSE:	0.034266866743564606
Epoch	66	MSE:	0.03411188721656799
Epoch	67	MSE:	0.0339549295604229
Epoch	68	MSE:	0.033795248717069626
Epoch	69	MSE:	0.03363209590315819
Epoch	70	MSE:	0.033464785665273666
Epoch	71	MSE:	0.033292725682258606
Epoch	72	MSE:	0.033115413039922714
Epoch	73	MSE:	0.03293246030807495
Epoch	74	MSE:	0.032743554562330246
Epoch	75	MSE:	0.03254842013120651
Epoch	76	MSE:	0.03234682232141495
Epoch	77	MSE:	0.03213850036263466
Epoch	78	MSE:	0.031923167407512665
Epoch	79	MSE:	0.031700458377599716
Epoch	80	MSE:	0.03146995231509209
Epoch	81	MSE:	0.031231148168444633
Epoch	82	MSE:	0.030983470380306244
Epoch	83	MSE:	0.030726296827197075
Epoch	84	MSE:	0.030458956956863403
Epoch	85	MSE:	0.030180761590600014
Epoch	86	MSE:	0.0298909954726696
Epoch	87	MSE:	0.029588960111141205
Epoch	88	MSE:	0.029273951426148415
Epoch	89	MSE:	0.02894526533782482
Epoch	90	MSE:	0.028602194041013718
Epoch	91	MSE:	0.0282440222799778
Epoch	92	MSE:	0.027870003134012222
Epoch	93	MSE:	0.027479348704218864
Epoch	94	MSE:	0.027071243152022362
Epoch	95	MSE:	0.02664480172097683
Epoch	96	MSE:	0.026199398562312126
Epoch	97	MSE:	0.025738658383488655

Epoch 98 MSE: 0.025278866291046143
Epoch 99 MSE: 0.024813251569867134
T-time: 10.425376653671265

=====

Train Score: 4.70 RMSE

=====

Validation Score: 30.15 RMSE

=====

=====

Time Step = 100 | Hidden States = 4 | Num Layers = 2

=====

Epoch 0 MSE: 0.1430378258228302
Epoch 1 MSE: 0.07693720608949661
Epoch 2 MSE: 0.031622499227523804
Epoch 3 MSE: 0.011049512773752213
Epoch 4 MSE: 0.013612537644803524
Epoch 5 MSE: 0.027644114568829536
Epoch 6 MSE: 0.037642866373062134
Epoch 7 MSE: 0.037966422736644745
Epoch 8 MSE: 0.030965788289904594
Epoch 9 MSE: 0.021140893921256065
Epoch 10 MSE: 0.012436799705028534
Epoch 11 MSE: 0.007185955066233873
Epoch 12 MSE: 0.005846691317856312
Epoch 13 MSE: 0.0074048410169780254
Epoch 14 MSE: 0.010168688371777534
Epoch 15 MSE: 0.01252957433462143
Epoch 16 MSE: 0.013433768413960934
Epoch 17 MSE: 0.01253867894411087
Epoch 18 MSE: 0.010139255784451962
Epoch 19 MSE: 0.006964762229472399
Epoch 20 MSE: 0.003913754131644964
Epoch 21 MSE: 0.0017700808821246028
Epoch 22 MSE: 0.0009519588784314692
Epoch 23 MSE: 0.0013749684439972043
Epoch 24 MSE: 0.0025069962721318007
Epoch 25 MSE: 0.0036178019363433123
Epoch 26 MSE: 0.004109582398086786
Epoch 27 MSE: 0.003757740370929241
Epoch 28 MSE: 0.0027525904588401318
Epoch 29 MSE: 0.0015539025189355016
Epoch 30 MSE: 0.0006525843637064099
Epoch 31 MSE: 0.0003502995823509991
Epoch 32 MSE: 0.0006458056159317493
Epoch 33 MSE: 0.0012704705586656928

Epoch	34	MSE:	0.001847126055508852
Epoch	35	MSE:	0.0020826528780162334
Epoch	36	MSE:	0.001891821506433189
Epoch	37	MSE:	0.0014006670098751783
Epoch	38	MSE:	0.0008499042596668005
Epoch	39	MSE:	0.00046326578012667596
Epoch	40	MSE:	0.0003480477025732398
Epoch	41	MSE:	0.0004676615644712001
Epoch	42	MSE:	0.00068622303660959
Epoch	43	MSE:	0.0008514178916811943
Epoch	44	MSE:	0.0008692992851138115
Epoch	45	MSE:	0.0007370426901616156
Epoch	46	MSE:	0.0005265134968794882
Epoch	47	MSE:	0.00033610890386626124
Epoch	48	MSE:	0.00023948773741722107
Epoch	49	MSE:	0.0002554926904849708
Epoch	50	MSE:	0.00034903912455774844
Epoch	51	MSE:	0.00045667693484574556
Epoch	52	MSE:	0.0005204864428378642
Epoch	53	MSE:	0.0005133823142386973
Epoch	54	MSE:	0.0004460102063603699
Epoch	55	MSE:	0.0003553171409294009
Epoch	56	MSE:	0.00028287683380767703
Epoch	57	MSE:	0.0002543629379943013
Epoch	58	MSE:	0.0002695950970519334
Epoch	59	MSE:	0.000306617293972522
Epoch	60	MSE:	0.00033611274557188153
Epoch	61	MSE:	0.0003376381646376103
Epoch	62	MSE:	0.0003090652171522379
Epoch	63	MSE:	0.000265115755610168
Epoch	64	MSE:	0.00022713404905516654
Epoch	65	MSE:	0.00021069408103358
Epoch	66	MSE:	0.0002180135197704658
Epoch	67	MSE:	0.00023866433184593916
Epoch	68	MSE:	0.00025708790053613484
Epoch	69	MSE:	0.0002618463186081499
Epoch	70	MSE:	0.000251227495027706
Epoch	71	MSE:	0.00023256671556737274
Epoch	72	MSE:	0.00021655850287061185
Epoch	73	MSE:	0.00021052405645605177
Epoch	74	MSE:	0.00021467340411618352
Epoch	75	MSE:	0.00022312600049190223
Epoch	76	MSE:	0.0002283899812027812
Epoch	77	MSE:	0.0002261161571368575
Epoch	78	MSE:	0.00021722563542425632
Epoch	79	MSE:	0.00020652667444664985
Epoch	80	MSE:	0.0001992050965782255
Epoch	81	MSE:	0.00019765015167649835

Epoch 82 MSE: 0.00020049582235515118
Epoch 83 MSE: 0.00020409433636814356
Epoch 84 MSE: 0.00020512494666036218
Epoch 85 MSE: 0.00020255429262761027
Epoch 86 MSE: 0.00019785262702498585
Epoch 87 MSE: 0.0001936209009727463
Epoch 88 MSE: 0.0001917387271532789
Epoch 89 MSE: 0.00019227426673751324
Epoch 90 MSE: 0.00019372614042367786
Epoch 91 MSE: 0.0001942384260473773
Epoch 92 MSE: 0.0001928568526636809
Epoch 93 MSE: 0.00019000806787516922
Epoch 94 MSE: 0.00018700308282859623
Epoch 95 MSE: 0.00018504104809835553
Epoch 96 MSE: 0.00018444607849232852
Epoch 97 MSE: 0.00018460462160874158
Epoch 98 MSE: 0.00018453829397913069
Epoch 99 MSE: 0.00018362636910751462
T-time: 16.862977027893066

=====

Train Score: 0.40 RMSE

=====

Validation Score: 10.48 RMSE

=====

Epoch 0 MSE: 0.25452083349227905
Epoch 1 MSE: 0.20916756987571716
Epoch 2 MSE: 0.17047804594039917
Epoch 3 MSE: 0.13906444609165192
Epoch 4 MSE: 0.11229383200407028
Epoch 5 MSE: 0.08969568461179733
Epoch 6 MSE: 0.07082884758710861
Epoch 7 MSE: 0.05529358983039856
Epoch 8 MSE: 0.0426965206861496
Epoch 9 MSE: 0.032649483531713486
Epoch 10 MSE: 0.024781275540590286
Epoch 11 MSE: 0.018695948645472527
Epoch 12 MSE: 0.014015793800354004
Epoch 13 MSE: 0.010395782999694347
Epoch 14 MSE: 0.007559140212833881
Epoch 15 MSE: 0.0055657727643847466
Epoch 16 MSE: 0.0035964257549494505
Epoch 17 MSE: 0.0018728901632130146
Epoch 18 MSE: 0.0009375683148391545
Epoch 19 MSE: 0.0009218588820658624
Epoch 20 MSE: 0.0012911104131489992
Epoch 21 MSE: 0.0013609880115836859

Epoch 22 MSE: 0.0012630043784156442
 Epoch 23 MSE: 0.0013212631456553936
 Epoch 24 MSE: 0.0016322213923558593
 Epoch 25 MSE: 0.002036736812442541
 Epoch 26 MSE: 0.002242014743387699
 Epoch 27 MSE: 0.0021013342775404453
 Epoch 28 MSE: 0.0016750541981309652
 Epoch 29 MSE: 0.0011511044576764107
 Epoch 30 MSE: 0.0007241112180054188
 Epoch 31 MSE: 0.0004883521469309926
 Epoch 32 MSE: 0.0004285263130441308
 Epoch 33 MSE: 0.0004285695031285286
 Epoch 34 MSE: 0.0003493299300316721
 Epoch 35 MSE: 0.00022226931469049305
 Epoch 36 MSE: 0.0001659430708969012
 Epoch 37 MSE: 0.0002331295982003212
 Epoch 38 MSE: 0.00037336276727728546
 Epoch 39 MSE: 0.000490793667268008
 Epoch 40 MSE: 0.0005220070597715676
 Epoch 41 MSE: 0.0004739889409393072
 Epoch 42 MSE: 0.00040270996396429837
 Epoch 43 MSE: 0.0003609791456256062
 Epoch 44 MSE: 0.00036003056447952986
 Epoch 45 MSE: 0.00035864327219314873
 Epoch 46 MSE: 0.000298698345432058
 Epoch 47 MSE: 0.00019877147860825062
 Epoch 48 MSE: 0.00012683292152360082
 Epoch 49 MSE: 0.00011226439528400078
 Epoch 50 MSE: 0.0001238432596437633
 Epoch 51 MSE: 0.00012060988956363872
 Epoch 52 MSE: 9.504747140454128e-05
 Epoch 53 MSE: 7.430243567796424e-05
 Epoch 54 MSE: 8.615037222625688e-05
 Epoch 55 MSE: 0.00011851701856357977
 Epoch 56 MSE: 0.00013198770466260612
 Epoch 57 MSE: 0.00011459337110863999
 Epoch 58 MSE: 9.321865218225867e-05
 Epoch 59 MSE: 8.865517156664282e-05
 Epoch 60 MSE: 9.019664867082611e-05
 Epoch 61 MSE: 7.79620386310853e-05
 Epoch 62 MSE: 5.261636761133559e-05
 Epoch 63 MSE: 3.371151979081333e-05
 Epoch 64 MSE: 3.254317562095821e-05
 Epoch 65 MSE: 3.780103361350484e-05
 Epoch 66 MSE: 3.458702121861279e-05
 Epoch 67 MSE: 2.7493257221067324e-05
 Epoch 68 MSE: 2.922449493780732e-05
 Epoch 69 MSE: 3.790163464145735e-05

```

Epoch 70 MSE: 4.168358282186091e-05
Epoch 71 MSE: 3.6940135032637045e-05
Epoch 72 MSE: 3.157382889185101e-05
Epoch 73 MSE: 3.139945329166949e-05
Epoch 74 MSE: 3.171915886923671e-05
Epoch 75 MSE: 2.684970968402922e-05
Epoch 76 MSE: 2.0315068468335085e-05
Epoch 77 MSE: 1.814650750020519e-05
Epoch 78 MSE: 1.9514855011948384e-05
Epoch 79 MSE: 1.967233583854977e-05
Epoch 80 MSE: 1.795180833141785e-05
Epoch 81 MSE: 1.7793712686398067e-05
Epoch 82 MSE: 2.016461075982079e-05
Epoch 83 MSE: 2.1855295926798135e-05
Epoch 84 MSE: 2.0960744222975336e-05
Epoch 85 MSE: 1.9561301087378524e-05
Epoch 86 MSE: 1.953223727468867e-05
Epoch 87 MSE: 1.9607679860200733e-05
Epoch 88 MSE: 1.8251765141030774e-05
Epoch 89 MSE: 1.6525464161532e-05
Epoch 90 MSE: 1.6133697499753907e-05
Epoch 91 MSE: 1.6621022950857878e-05
Epoch 92 MSE: 1.655544292589184e-05
Epoch 93 MSE: 1.611725747352466e-05
Epoch 94 MSE: 1.6388392396038398e-05
Epoch 95 MSE: 1.7124997611972503e-05
Epoch 96 MSE: 1.7253934856853448e-05
Epoch 97 MSE: 1.6787575077614747e-05
Epoch 98 MSE: 1.657145912759006e-05
Epoch 99 MSE: 1.6647629308863543e-05
T-time: 19.422314167022705

```

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=====
Train Score: 0.12 RMSE
=====
Validation Score: 6.08 RMSE
=====

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=====
Time Step = 100 | Hidden States = 8 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.052758246660232544
Epoch 1 MSE: 0.03370301425457001
Epoch 2 MSE: 0.027502691373229027
Epoch 3 MSE: 0.0312129408121109
Epoch 4 MSE: 0.031028863042593002
Epoch 5 MSE: 0.02607070654630661

```

Epoch 6 MSE: 0.02098289504647255
Epoch 7 MSE: 0.01816316321492195
Epoch 8 MSE: 0.017349887639284134
Epoch 9 MSE: 0.017024796456098557
Epoch 10 MSE: 0.01572861336171627
Epoch 11 MSE: 0.012917103245854378
Epoch 12 MSE: 0.009198262356221676
Epoch 13 MSE: 0.006009088363498449
Epoch 14 MSE: 0.004698739852756262
Epoch 15 MSE: 0.004736165050417185
Epoch 16 MSE: 0.003560083918273449
Epoch 17 MSE: 0.001005821512080729
Epoch 18 MSE: 0.0005007185391150415
Epoch 19 MSE: 0.002890951232984662
Epoch 20 MSE: 0.0033850865438580513
Epoch 21 MSE: 0.002188516315072775
Epoch 22 MSE: 0.002893658820539713
Epoch 23 MSE: 0.0032696842681616545
Epoch 24 MSE: 0.0017492207698523998
Epoch 25 MSE: 0.0006862803711555898
Epoch 26 MSE: 0.0007238128455355763
Epoch 27 MSE: 0.000816847721580416
Epoch 28 MSE: 0.0005477856611832976
Epoch 29 MSE: 0.000298538914648816
Epoch 30 MSE: 0.000407306884881109
Epoch 31 MSE: 0.0007576416828669608
Epoch 32 MSE: 0.0009980618488043547
Epoch 33 MSE: 0.0009592025307938457
Epoch 34 MSE: 0.0007726755575276911
Epoch 35 MSE: 0.0006504410412162542
Epoch 36 MSE: 0.0006470066728070378
Epoch 37 MSE: 0.0006441306904889643
Epoch 38 MSE: 0.0005206864443607628
Epoch 39 MSE: 0.0003029796644113958
Epoch 40 MSE: 0.00013836374273523688
Epoch 41 MSE: 0.00012417386460583657
Epoch 42 MSE: 0.0001913132146000862
Epoch 43 MSE: 0.00020507239969447255
Epoch 44 MSE: 0.00015617924509570003
Epoch 45 MSE: 0.0001527784625068307
Epoch 46 MSE: 0.00023048697039484978
Epoch 47 MSE: 0.0002921074628829956
Epoch 48 MSE: 0.00026077224174514413
Epoch 49 MSE: 0.00018668088887352496
Epoch 50 MSE: 0.00015367315791081637
Epoch 51 MSE: 0.00015664829697925597
Epoch 52 MSE: 0.00013611768372356892
Epoch 53 MSE: 8.610267104813829e-05

Epoch 54 MSE: 5.6497345212846994e-05
Epoch 55 MSE: 7.069025014061481e-05
Epoch 56 MSE: 9.773895726539195e-05
Epoch 57 MSE: 0.00010375407146057114
Epoch 58 MSE: 9.399465488968417e-05
Epoch 59 MSE: 9.347120794700459e-05
Epoch 60 MSE: 0.00010589262819848955
Epoch 61 MSE: 0.00011059387179557234
Epoch 62 MSE: 9.567154484102502e-05
Epoch 63 MSE: 7.495981844840571e-05
Epoch 64 MSE: 6.620064959861338e-05
Epoch 65 MSE: 6.700378435198218e-05
Epoch 66 MSE: 6.354784272843972e-05
Epoch 67 MSE: 5.430732198874466e-05
Epoch 68 MSE: 5.105148011352867e-05
Epoch 69 MSE: 5.815177064505406e-05
Epoch 70 MSE: 6.522845797007903e-05
Epoch 71 MSE: 6.409314664779231e-05
Epoch 72 MSE: 6.010821016388945e-05
Epoch 73 MSE: 6.0318408941384405e-05
Epoch 74 MSE: 6.148170359665528e-05
Epoch 75 MSE: 5.760142084909603e-05
Epoch 76 MSE: 5.104093725094572e-05
Epoch 77 MSE: 4.8189900553552434e-05
Epoch 78 MSE: 4.918296690448187e-05
Epoch 79 MSE: 4.927756526740268e-05
Epoch 80 MSE: 4.751200685859658e-05
Epoch 81 MSE: 4.723247548099607e-05
Epoch 82 MSE: 4.928407724946737e-05
Epoch 83 MSE: 5.0528298743302e-05
Epoch 84 MSE: 4.925778557662852e-05
Epoch 85 MSE: 4.752033419208601e-05
Epoch 86 MSE: 4.709775748779066e-05
Epoch 87 MSE: 4.678349432651885e-05
Epoch 88 MSE: 4.522770905168727e-05
Epoch 89 MSE: 4.3582767830230296e-05
Epoch 90 MSE: 4.335939956945367e-05
Epoch 91 MSE: 4.386331420391798e-05
Epoch 92 MSE: 4.371700561023317e-05
Epoch 93 MSE: 4.321482265368104e-05
Epoch 94 MSE: 4.331305171945132e-05
Epoch 95 MSE: 4.363021798781119e-05
Epoch 96 MSE: 4.32275228376966e-05
Epoch 97 MSE: 4.235742744640447e-05
Epoch 98 MSE: 4.186639125691727e-05
Epoch 99 MSE: 4.168635496171191e-05
T-time: 12.743440628051758

```
=====
Train Score: 0.19 RMSE
=====
Validation Score: 6.65 RMSE
=====
```

```
Epoch 0 MSE: 0.05109736695885658
Epoch 1 MSE: 0.040121905505657196
Epoch 2 MSE: 0.03541479632258415
Epoch 3 MSE: 0.036108292639255524
Epoch 4 MSE: 0.0365922786295414
Epoch 5 MSE: 0.034704841673374176
Epoch 6 MSE: 0.031825095415115356
Epoch 7 MSE: 0.029382888227701187
Epoch 8 MSE: 0.02786346711218357
Epoch 9 MSE: 0.02700050361454487
Epoch 10 MSE: 0.026211902499198914
Epoch 11 MSE: 0.02504120022058487
Epoch 12 MSE: 0.023334143683314323
Epoch 13 MSE: 0.02117413654923439
Epoch 14 MSE: 0.01879858784377575
Epoch 15 MSE: 0.016462940722703934
Epoch 16 MSE: 0.014535697177052498
Epoch 17 MSE: 0.01334160752594471
Epoch 18 MSE: 0.012098581530153751
Epoch 19 MSE: 0.01080717146396637
Epoch 20 MSE: 0.009496034123003483
Epoch 21 MSE: 0.00821207370609045
Epoch 22 MSE: 0.00695671234279871
Epoch 23 MSE: 0.0056976573541760445
Epoch 24 MSE: 0.004421565216034651
Epoch 25 MSE: 0.003209504997357726
Epoch 26 MSE: 0.0021774808410555124
Epoch 27 MSE: 0.0013674997026100755
Epoch 28 MSE: 0.000741584983188659
Epoch 29 MSE: 0.0003823319566436112
Epoch 30 MSE: 0.00042484179721213877
Epoch 31 MSE: 0.000704567413777113
Epoch 32 MSE: 0.0011890815803781152
Epoch 33 MSE: 0.0017360675847157836
Epoch 34 MSE: 0.002020458457991481
Epoch 35 MSE: 0.00210923096165061
Epoch 36 MSE: 0.0018773205811157823
Epoch 37 MSE: 0.0015339866513386369
Epoch 38 MSE: 0.0011479214299470186
Epoch 39 MSE: 0.0007834815187379718
Epoch 40 MSE: 0.0005459145759232342
Epoch 41 MSE: 0.00038621900603175163
```


Epoch 42 MSE: 0.0003189997805748135
Epoch 43 MSE: 0.0003327029407955706
Epoch 44 MSE: 0.00036984452162869275
Epoch 45 MSE: 0.00043137752800248563
Epoch 46 MSE: 0.0005029657040722668
Epoch 47 MSE: 0.0005517334211617708
Epoch 48 MSE: 0.0005828880821354687
Epoch 49 MSE: 0.0005953789805062115
Epoch 50 MSE: 0.0005730378907173872
Epoch 51 MSE: 0.0005253053386695683
Epoch 52 MSE: 0.0004586531431414187
Epoch 53 MSE: 0.0003650575818028301
Epoch 54 MSE: 0.00025610937154851854
Epoch 55 MSE: 0.00015071380767039955
Epoch 56 MSE: 7.900640048319474e-05
Epoch 57 MSE: 9.684777614893392e-05
Epoch 58 MSE: 0.00018937278946395963
Epoch 59 MSE: 0.00022779343998990953
Epoch 60 MSE: 0.00018820184050127864
Epoch 61 MSE: 0.00011387122503947467
Epoch 62 MSE: 6.0225531342439353e-05
Epoch 63 MSE: 5.3598607337335125e-05
Epoch 64 MSE: 6.739997479598969e-05
Epoch 65 MSE: 8.163657184923068e-05
Epoch 66 MSE: 9.67164451139979e-05
Epoch 67 MSE: 0.00010472640860825777
Epoch 68 MSE: 9.866491745924577e-05
Epoch 69 MSE: 8.850340236676857e-05
Epoch 70 MSE: 7.786873175064102e-05
Epoch 71 MSE: 6.094769560149871e-05
Epoch 72 MSE: 4.627875750884414e-05
Epoch 73 MSE: 3.8755715650040656e-05
Epoch 74 MSE: 3.302036566310562e-05
Epoch 75 MSE: 3.677017230074853e-05
Epoch 76 MSE: 4.4277807319303975e-05
Epoch 77 MSE: 4.6914705308154225e-05
Epoch 78 MSE: 4.633888602256775e-05
Epoch 79 MSE: 3.6809338780585676e-05
Epoch 80 MSE: 2.7751722882385366e-05
Epoch 81 MSE: 2.3243252144311555e-05
Epoch 82 MSE: 2.1568630472756922e-05
Epoch 83 MSE: 2.5301435016444884e-05
Epoch 84 MSE: 2.844770460797008e-05
Epoch 85 MSE: 3.069187732762657e-05
Epoch 86 MSE: 3.164150984957814e-05
Epoch 87 MSE: 2.9125150831532665e-05
Epoch 88 MSE: 2.6715555577538908e-05
Epoch 89 MSE: 2.3754057110636495e-05

```

Epoch 90 MSE: 2.220932765339967e-05
Epoch 91 MSE: 2.311996286152862e-05
Epoch 92 MSE: 2.4241604478447698e-05
Epoch 93 MSE: 2.5880292014335282e-05
Epoch 94 MSE: 2.555760511313565e-05
Epoch 95 MSE: 2.4031020075199194e-05
Epoch 96 MSE: 2.2392745449906215e-05
Epoch 97 MSE: 2.087215762003325e-05
Epoch 98 MSE: 2.0833655071328394e-05
Epoch 99 MSE: 2.104732448060531e-05
T-time: 13.914803266525269

```

```

=====
Train Score: 0.14 RMSE

```

```

=====
Validation Score: 2.16 RMSE
=====

```

```

=====
Time Step = 100 | Hidden States = 8 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.04955081269145012
Epoch 1 MSE: 0.03634528070688248
Epoch 2 MSE: 0.04230405017733574
Epoch 3 MSE: 0.03395857289433479
Epoch 4 MSE: 0.026234731078147888
Epoch 5 MSE: 0.025297123938798904
Epoch 6 MSE: 0.025684325024485588
Epoch 7 MSE: 0.021505629643797874
Epoch 8 MSE: 0.014640149660408497
Epoch 9 MSE: 0.01035577803850174
Epoch 10 MSE: 0.010022811591625214
Epoch 11 MSE: 0.007632232271134853
Epoch 12 MSE: 0.0021179078612476587
Epoch 13 MSE: 0.0013066281098872423
Epoch 14 MSE: 0.004965323023498058
Epoch 15 MSE: 0.0035793636925518513
Epoch 16 MSE: 0.004890638869255781
Epoch 17 MSE: 0.005850678775459528
Epoch 18 MSE: 0.0027305453550070524
Epoch 19 MSE: 0.0017630283255130053
Epoch 20 MSE: 0.0018750455928966403
Epoch 21 MSE: 0.0010380642488598824
Epoch 22 MSE: 0.0004938273341394961
Epoch 23 MSE: 0.0010367565555498004
Epoch 24 MSE: 0.0018276871414855123
Epoch 25 MSE: 0.001994062215089798

```

Epoch	26	MSE:	0.0016888407990336418
Epoch	27	MSE:	0.0015121519099920988
Epoch	28	MSE:	0.0015987835358828306
Epoch	29	MSE:	0.001553111826069653
Epoch	30	MSE:	0.001115224789828062
Epoch	31	MSE:	0.0005782873486168683
Epoch	32	MSE:	0.0003897836431860924
Epoch	33	MSE:	0.0005090973572805524
Epoch	34	MSE:	0.0005227264482527971
Epoch	35	MSE:	0.0003835480601992458
Epoch	36	MSE:	0.0004452413122635335
Epoch	37	MSE:	0.0007045202073641121
Epoch	38	MSE:	0.0007578636286780238
Epoch	39	MSE:	0.000562043976970017
Epoch	40	MSE:	0.00044319246080704033
Epoch	41	MSE:	0.00044489590800367296
Epoch	42	MSE:	0.0003587294486351311
Epoch	43	MSE:	0.0002084727311739698
Epoch	44	MSE:	0.00018107790674548596
Epoch	45	MSE:	0.00026896537747234106
Epoch	46	MSE:	0.00031688084709458053
Epoch	47	MSE:	0.0002924614818766713
Epoch	48	MSE:	0.00028794544050469995
Epoch	49	MSE:	0.000322183157550171
Epoch	50	MSE:	0.0003140948247164488
Epoch	51	MSE:	0.00024199605104513466
Epoch	52	MSE:	0.0001842779602156952
Epoch	53	MSE:	0.00018044172611553222
Epoch	54	MSE:	0.00017845991533249617
Epoch	55	MSE:	0.00015300371160265058
Epoch	56	MSE:	0.00015171768609434366
Epoch	57	MSE:	0.00018546033243183047
Epoch	58	MSE:	0.00019860183238051832
Epoch	59	MSE:	0.00017798662884160876
Epoch	60	MSE:	0.00016611797036603093
Epoch	61	MSE:	0.00016574868641328067
Epoch	62	MSE:	0.00014721071056555957
Epoch	63	MSE:	0.00012289003643672913
Epoch	64	MSE:	0.00012164708459749818
Epoch	65	MSE:	0.00013100673095323145
Epoch	66	MSE:	0.00012904270261060447
Epoch	67	MSE:	0.00012606206291820854
Epoch	68	MSE:	0.00013261561980471015
Epoch	69	MSE:	0.00013390764070209116
Epoch	70	MSE:	0.00012258582864888012
Epoch	71	MSE:	0.00011354466550983489
Epoch	72	MSE:	0.00011218975123483688
Epoch	73	MSE:	0.00010789754014695063

```

Epoch 74 MSE: 0.00010173345799557865
Epoch 75 MSE: 0.00010324117465643212
Epoch 76 MSE: 0.00010728617780841887
Epoch 77 MSE: 0.00010537539492361248
Epoch 78 MSE: 0.00010261990973958746
Epoch 79 MSE: 0.00010259784176014364
Epoch 80 MSE: 9.950710227712989e-05
Epoch 81 MSE: 9.400874114362523e-05
Epoch 82 MSE: 9.227946429746225e-05
Epoch 83 MSE: 9.242090891348198e-05
Epoch 84 MSE: 9.072060493053868e-05
Epoch 85 MSE: 8.999174315249547e-05
Epoch 86 MSE: 9.098466398427263e-05
Epoch 87 MSE: 8.996463293442503e-05
Epoch 88 MSE: 8.744437946006656e-05
Epoch 89 MSE: 8.623376197647303e-05
Epoch 90 MSE: 8.49937423481606e-05
Epoch 91 MSE: 8.282058843178675e-05
Epoch 92 MSE: 8.191809320123866e-05
Epoch 93 MSE: 8.202838216675445e-05
Epoch 94 MSE: 8.123437874019146e-05
Epoch 95 MSE: 8.038568194024265e-05
Epoch 96 MSE: 8.007428550627083e-05
Epoch 97 MSE: 7.897074829088524e-05
Epoch 98 MSE: 7.747475319774821e-05
Epoch 99 MSE: 7.672120409552008e-05
T-time: 26.838262796401978

```

```

=====
Train Score: 0.26 RMSE
=====
Validation Score: 9.18 RMSE
=====

```

```

Epoch 0 MSE: 0.03814024105668068
Epoch 1 MSE: 0.03255724161863327
Epoch 2 MSE: 0.0334225632250309
Epoch 3 MSE: 0.03216390684247017
Epoch 4 MSE: 0.02972523495554924
Epoch 5 MSE: 0.02808365412056446
Epoch 6 MSE: 0.026865366846323013
Epoch 7 MSE: 0.02502509579062462
Epoch 8 MSE: 0.02226242609322071
Epoch 9 MSE: 0.01942112296819687
Epoch 10 MSE: 0.017589300870895386
Epoch 11 MSE: 0.01580456644296646
Epoch 12 MSE: 0.012759333476424217
Epoch 13 MSE: 0.010367884300649166

```

Epoch	14	MSE:	0.008634249679744244
Epoch	15	MSE:	0.006265830248594284
Epoch	16	MSE:	0.004591174423694611
Epoch	17	MSE:	0.003527256892994046
Epoch	18	MSE:	0.0024632601998746395
Epoch	19	MSE:	0.0022792730014771223
Epoch	20	MSE:	0.0027830288745462894
Epoch	21	MSE:	0.0028451071120798588
Epoch	22	MSE:	0.0031160556245595217
Epoch	23	MSE:	0.0024038543924689293
Epoch	24	MSE:	0.0017193291569128633
Epoch	25	MSE:	0.0012765114661306143
Epoch	26	MSE:	0.0012255915207788348
Epoch	27	MSE:	0.0017374976305291057
Epoch	28	MSE:	0.0019392067333683372
Epoch	29	MSE:	0.0020768940448760986
Epoch	30	MSE:	0.0017260892782360315
Epoch	31	MSE:	0.0013341237790882587
Epoch	32	MSE:	0.0010398642625659704
Epoch	33	MSE:	0.0008424335974268615
Epoch	34	MSE:	0.0009887132328003645
Epoch	35	MSE:	0.0010539896320551634
Epoch	36	MSE:	0.001175962039269507
Epoch	37	MSE:	0.0010219232644885778
Epoch	38	MSE:	0.0008733487920835614
Epoch	39	MSE:	0.0006699134246446192
Epoch	40	MSE:	0.0005738312029279768
Epoch	41	MSE:	0.0005676192231476307
Epoch	42	MSE:	0.0005844699335284531
Epoch	43	MSE:	0.0006463667377829552
Epoch	44	MSE:	0.0006184910307638347
Epoch	45	MSE:	0.0006064834888093174
Epoch	46	MSE:	0.0005199135048314929
Epoch	47	MSE:	0.00046616396866738796
Epoch	48	MSE:	0.00041031278669834137
Epoch	49	MSE:	0.00039369918522424996
Epoch	50	MSE:	0.0004033374134451151
Epoch	51	MSE:	0.0004139204102102667
Epoch	52	MSE:	0.00042978956480510533
Epoch	53	MSE:	0.00041342468466609716
Epoch	54	MSE:	0.0003975971485488117
Epoch	55	MSE:	0.0003576391318347305
Epoch	56	MSE:	0.00033812917536124587
Epoch	57	MSE:	0.0003132112033199519
Epoch	58	MSE:	0.0003139838809147477
Epoch	59	MSE:	0.0003070438397116959
Epoch	60	MSE:	0.00031359324930235744
Epoch	61	MSE:	0.0003030591760762036

Epoch 62 MSE: 0.00029714309494011104
Epoch 63 MSE: 0.00027603833586908877
Epoch 64 MSE: 0.0002634139091242105
Epoch 65 MSE: 0.00024516595294699073
Epoch 66 MSE: 0.00023973510542418808
Epoch 67 MSE: 0.00023206035257317126
Epoch 68 MSE: 0.00023215280089061707
Epoch 69 MSE: 0.00022695255756843835
Epoch 70 MSE: 0.0002219052257714793
Epoch 71 MSE: 0.00021312448370736092
Epoch 72 MSE: 0.00020339414186310023
Epoch 73 MSE: 0.00019617103680502623
Epoch 74 MSE: 0.00018826205632649362
Epoch 75 MSE: 0.00018492680101189762
Epoch 76 MSE: 0.00017997586110141128
Epoch 77 MSE: 0.00017755807493813336
Epoch 78 MSE: 0.0001724316825857386
Epoch 79 MSE: 0.00016682503337506205
Epoch 80 MSE: 0.00016062974464148283
Epoch 81 MSE: 0.00015370383334811777
Epoch 82 MSE: 0.00014909604215063155
Epoch 83 MSE: 0.00014397245831787586
Epoch 84 MSE: 0.00014058008673600852
Epoch 85 MSE: 0.0001369599049212411
Epoch 86 MSE: 0.00013260067498777062
Epoch 87 MSE: 0.0001287740160478279
Epoch 88 MSE: 0.00012395024532452226
Epoch 89 MSE: 0.00011981411080341786
Epoch 90 MSE: 0.00011626816558418795
Epoch 91 MSE: 0.00011241053289268166
Epoch 92 MSE: 0.00010926958930213004
Epoch 93 MSE: 0.00010595876665320247
Epoch 94 MSE: 0.00010223319986835122
Epoch 95 MSE: 9.883377060759813e-05
Epoch 96 MSE: 9.516964928479865e-05
Epoch 97 MSE: 9.1548114141915e-05
Epoch 98 MSE: 8.844841067912057e-05
Epoch 99 MSE: 8.538104157196358e-05
T-time: 27.54952907562256

=====
Train Score: 0.28 RMSE
=====
Validation Score: 6.96 RMSE
=====

=====
Time Step = 100 | Hidden States = 16 | Num Layers = 1

=====

Epoch 0 MSE: 0.11758647859096527
Epoch 1 MSE: 0.05803706496953964
Epoch 2 MSE: 0.030944831669330597
Epoch 3 MSE: 0.030643410980701447
Epoch 4 MSE: 0.04052218049764633
Epoch 5 MSE: 0.04076533019542694
Epoch 6 MSE: 0.033062707632780075
Epoch 7 MSE: 0.024847136810421944
Epoch 8 MSE: 0.02007955312728882
Epoch 9 MSE: 0.01916746236383915
Epoch 10 MSE: 0.020420417189598083
Epoch 11 MSE: 0.02123548649251461
Epoch 12 MSE: 0.019798552617430687
Epoch 13 MSE: 0.016144033521413803
Epoch 14 MSE: 0.011660048738121986
Epoch 15 MSE: 0.008103952743113041
Epoch 16 MSE: 0.0066263810731470585
Epoch 17 MSE: 0.0068076918832957745
Epoch 18 MSE: 0.006512082647532225
Epoch 19 MSE: 0.00405347952619195
Epoch 20 MSE: 0.0008810206782072783
Epoch 21 MSE: 0.000566395407076925
Epoch 22 MSE: 0.003596528898924589
Epoch 23 MSE: 0.0043672011233866215
Epoch 24 MSE: 0.002095557050779462
Epoch 25 MSE: 0.001317783142440021
Epoch 26 MSE: 0.0023658499121665955
Epoch 27 MSE: 0.0024154444690793753
Epoch 28 MSE: 0.0011583995074033737
Epoch 29 MSE: 0.00018338537483941764
Epoch 30 MSE: 0.00024888821644708514
Epoch 31 MSE: 0.0008671754039824009
Epoch 32 MSE: 0.0012631546705961227
Epoch 33 MSE: 0.0011413266183808446
Epoch 34 MSE: 0.0007438190514221787
Epoch 35 MSE: 0.00047288130735978484
Epoch 36 MSE: 0.0005189362564124167
Epoch 37 MSE: 0.0007487731636501849
Epoch 38 MSE: 0.0008753315778449178
Epoch 39 MSE: 0.0007351385429501534
Epoch 40 MSE: 0.00042363404645584524
Epoch 41 MSE: 0.00018060010916087776
Epoch 42 MSE: 0.00015628359687980264
Epoch 43 MSE: 0.00028347971965558827
Epoch 44 MSE: 0.0003680596128106117
Epoch 45 MSE: 0.0002995951799675822

Epoch	46	MSE:	0.00015811111370567232
Epoch	47	MSE:	0.00010428462701383978
Epoch	48	MSE:	0.0001870493433671072
Epoch	49	MSE:	0.00029474624898284674
Epoch	50	MSE:	0.00029900865047238767
Epoch	51	MSE:	0.0002030063042184338
Epoch	52	MSE:	0.00011555827222764492
Epoch	53	MSE:	0.00010989107249770314
Epoch	54	MSE:	0.00015229017299134284
Epoch	55	MSE:	0.00016530303400941193
Epoch	56	MSE:	0.0001240126439370215
Epoch	57	MSE:	7.234953227452934e-05
Epoch	58	MSE:	6.113363633630797e-05
Epoch	59	MSE:	9.180145571008325e-05
Epoch	60	MSE:	0.0001235009840456769
Epoch	61	MSE:	0.00012298715591896325
Epoch	62	MSE:	9.691436571301892e-05
Epoch	63	MSE:	7.635901420144364e-05
Epoch	64	MSE:	7.894635200500488e-05
Epoch	65	MSE:	9.250585571862757e-05
Epoch	66	MSE:	9.382109419675544e-05
Epoch	67	MSE:	7.667767204111442e-05
Epoch	68	MSE:	5.7056371588259935e-05
Epoch	69	MSE:	5.2511422836687416e-05
Epoch	70	MSE:	6.213389860931784e-05
Epoch	71	MSE:	7.019493205007166e-05
Epoch	72	MSE:	6.654296157648787e-05
Epoch	73	MSE:	5.739309926866554e-05
Epoch	74	MSE:	5.470553514896892e-05
Epoch	75	MSE:	6.021930312272161e-05
Epoch	76	MSE:	6.471433880506083e-05
Epoch	77	MSE:	6.112811388447881e-05
Epoch	78	MSE:	5.30413853994105e-05
Epoch	79	MSE:	4.870944394497201e-05
Epoch	80	MSE:	5.0387479859637097e-05
Epoch	81	MSE:	5.289973705657758e-05
Epoch	82	MSE:	5.153686652192846e-05
Epoch	83	MSE:	4.780182644026354e-05
Epoch	84	MSE:	4.6280660171760246e-05
Epoch	85	MSE:	4.818617890123278e-05
Epoch	86	MSE:	5.0254162488272414e-05
Epoch	87	MSE:	4.946241097059101e-05
Epoch	88	MSE:	4.670177077059634e-05
Epoch	89	MSE:	4.497995905694552e-05
Epoch	90	MSE:	4.5304634113563225e-05
Epoch	91	MSE:	4.583031477523036e-05
Epoch	92	MSE:	4.482888107304461e-05
Epoch	93	MSE:	4.3010742956539616e-05

Epoch 94 MSE: 4.222968709655106e-05
Epoch 95 MSE: 4.2828538425965235e-05
Epoch 96 MSE: 4.33793684351258e-05
Epoch 97 MSE: 4.281914152670652e-05
Epoch 98 MSE: 4.1750659875106066e-05
Epoch 99 MSE: 4.12955523643177e-05
T-time: 21.05155897140503

=====
Train Score: 0.19 RMSE
=====
Validation Score: 5.09 RMSE
=====

Epoch 0 MSE: 0.11906330287456512
Epoch 1 MSE: 0.09229088574647903
Epoch 2 MSE: 0.06819219887256622
Epoch 3 MSE: 0.04720387980341911
Epoch 4 MSE: 0.030279239639639854
Epoch 5 MSE: 0.020152108743786812
Epoch 6 MSE: 0.020211825147271156
Epoch 7 MSE: 0.027389658614993095
Epoch 8 MSE: 0.030620332807302475
Epoch 9 MSE: 0.0266322772949934
Epoch 10 MSE: 0.019531983882188797
Epoch 11 MSE: 0.012870531529188156
Epoch 12 MSE: 0.008912532590329647
Epoch 13 MSE: 0.006780112162232399
Epoch 14 MSE: 0.005625840276479721
Epoch 15 MSE: 0.004456528462469578
Epoch 16 MSE: 0.0033140445593744516
Epoch 17 MSE: 0.0020863397512584925
Epoch 18 MSE: 0.0013528363779187202
Epoch 19 MSE: 0.00170896016061306
Epoch 20 MSE: 0.0024419911205768585
Epoch 21 MSE: 0.00225307559594512
Epoch 22 MSE: 0.0017978708492591977
Epoch 23 MSE: 0.001903480850160122
Epoch 24 MSE: 0.002334408462047577
Epoch 25 MSE: 0.0025381436571478844
Epoch 26 MSE: 0.0023182458244264126
Epoch 27 MSE: 0.0018224152736365795
Epoch 28 MSE: 0.0013512101722881198
Epoch 29 MSE: 0.001113801496103406
Epoch 30 MSE: 0.0011258339509367943
Epoch 31 MSE: 0.0011705233482643962
Epoch 32 MSE: 0.0010640276595950127
Epoch 33 MSE: 0.0008563718874938786

Epoch	34	MSE:	0.0006997244781814516
Epoch	35	MSE:	0.000661548285279423
Epoch	36	MSE:	0.0006982600316405296
Epoch	37	MSE:	0.0007243792060762644
Epoch	38	MSE:	0.0006832677754573524
Epoch	39	MSE:	0.0005907443119212985
Epoch	40	MSE:	0.00048745478852652013
Epoch	41	MSE:	0.00039641655166633427
Epoch	42	MSE:	0.0003330361796543002
Epoch	43	MSE:	0.0002826506970450282
Epoch	44	MSE:	0.00022631818137597293
Epoch	45	MSE:	0.0001680764544289559
Epoch	46	MSE:	0.00013199601380620152
Epoch	47	MSE:	0.00013201800175011158
Epoch	48	MSE:	0.0001521243975730613
Epoch	49	MSE:	0.00015721919771749526
Epoch	50	MSE:	0.0001346568897133693
Epoch	51	MSE:	0.00010601524991216138
Epoch	52	MSE:	9.609245898900554e-05
Epoch	53	MSE:	0.0001002774151857011
Epoch	54	MSE:	9.886072075460106e-05
Epoch	55	MSE:	8.778563642408699e-05
Epoch	56	MSE:	8.085501758614555e-05
Epoch	57	MSE:	8.624893962405622e-05
Epoch	58	MSE:	9.517552825855091e-05
Epoch	59	MSE:	9.507334470981732e-05
Epoch	60	MSE:	8.546841854695231e-05
Epoch	61	MSE:	7.640525291208178e-05
Epoch	62	MSE:	7.425591320497915e-05
Epoch	63	MSE:	7.4594201578293e-05
Epoch	64	MSE:	7.089712016750127e-05
Epoch	65	MSE:	6.496074638562277e-05
Epoch	66	MSE:	6.32770752417855e-05
Epoch	67	MSE:	6.650955765508115e-05
Epoch	68	MSE:	6.875198596389964e-05
Epoch	69	MSE:	6.635399768128991e-05
Epoch	70	MSE:	6.228369602467865e-05
Epoch	71	MSE:	6.0570189816644415e-05
Epoch	72	MSE:	6.039312211214565e-05
Epoch	73	MSE:	5.8585799706634134e-05
Epoch	74	MSE:	5.534162119147368e-05
Epoch	75	MSE:	5.3653584473067895e-05
Epoch	76	MSE:	5.432766192825511e-05
Epoch	77	MSE:	5.499847247847356e-05
Epoch	78	MSE:	5.3944582759868354e-05
Epoch	79	MSE:	5.2240102377254516e-05
Epoch	80	MSE:	5.144476017449051e-05
Epoch	81	MSE:	5.1107788749504834e-05

```

Epoch 82 MSE: 4.9908761866390705e-05
Epoch 83 MSE: 4.809626625501551e-05
Epoch 84 MSE: 4.70402737846598e-05
Epoch 85 MSE: 4.697146141552366e-05
Epoch 86 MSE: 4.680078927776776e-05
Epoch 87 MSE: 4.598536906996742e-05
Epoch 88 MSE: 4.516167246038094e-05
Epoch 89 MSE: 4.479105336940847e-05
Epoch 90 MSE: 4.436971357790753e-05
Epoch 91 MSE: 4.3442356400191784e-05
Epoch 92 MSE: 4.243043076712638e-05
Epoch 93 MSE: 4.187031663605012e-05
Epoch 94 MSE: 4.156784052611329e-05
Epoch 95 MSE: 4.107357744942419e-05
Epoch 96 MSE: 4.044989327667281e-05
Epoch 97 MSE: 4.001558045274578e-05
Epoch 98 MSE: 3.9702197682345286e-05
Epoch 99 MSE: 3.92000401916448e-05
T-time: 22.38549017906189

```

```

=====
Train Score: 0.19 RMSE
=====
Validation Score: 1.51 RMSE
=====

```

```

=====
Time Step = 100 | Hidden States = 16 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.10739584267139435
Epoch 1 MSE: 0.04208068922162056
Epoch 2 MSE: 0.06387277692556381
Epoch 3 MSE: 0.05165105685591698
Epoch 4 MSE: 0.03522034361958504
Epoch 5 MSE: 0.03431427478790283
Epoch 6 MSE: 0.03869042545557022
Epoch 7 MSE: 0.03660016134381294
Epoch 8 MSE: 0.029627542942762375
Epoch 9 MSE: 0.02489411272108555
Epoch 10 MSE: 0.025964519008994102
Epoch 11 MSE: 0.02610187791287899
Epoch 12 MSE: 0.020274996757507324
Epoch 13 MSE: 0.014692681841552258
Epoch 14 MSE: 0.01452951692044735
Epoch 15 MSE: 0.014304916374385357
Epoch 16 MSE: 0.007731779478490353
Epoch 17 MSE: 0.003471479984000325

```

Epoch	18	MSE:	0.006371133029460907
Epoch	19	MSE:	0.001998658524826169
Epoch	20	MSE:	0.006304416339844465
Epoch	21	MSE:	0.0050708334892988205
Epoch	22	MSE:	0.003669625846669078
Epoch	23	MSE:	0.00513914879411459
Epoch	24	MSE:	0.0013947589322924614
Epoch	25	MSE:	0.0013500502100214362
Epoch	26	MSE:	0.002610921859741211
Epoch	27	MSE:	0.0018213365692645311
Epoch	28	MSE:	0.001124784117564559
Epoch	29	MSE:	0.0018457244150340557
Epoch	30	MSE:	0.0025812448002398014
Epoch	31	MSE:	0.0021656963508576155
Epoch	32	MSE:	0.0013791058445349336
Epoch	33	MSE:	0.0012569569516927004
Epoch	34	MSE:	0.0014595986576750875
Epoch	35	MSE:	0.0011122594587504864
Epoch	36	MSE:	0.0004669853951781988
Epoch	37	MSE:	0.00047635086230002344
Epoch	38	MSE:	0.0009272071183659136
Epoch	39	MSE:	0.0008733256254345179
Epoch	40	MSE:	0.0006480040610767901
Epoch	41	MSE:	0.0008587614865973592
Epoch	42	MSE:	0.0009174438891932368
Epoch	43	MSE:	0.0005489252507686615
Epoch	44	MSE:	0.00036374886985868216
Epoch	45	MSE:	0.0004721950099337846
Epoch	46	MSE:	0.00046349127660505474
Epoch	47	MSE:	0.00034883845364674926
Epoch	48	MSE:	0.00039380230009555817
Epoch	49	MSE:	0.0005263059865683317
Epoch	50	MSE:	0.0005141963483765721
Epoch	51	MSE:	0.00039321600343100727
Epoch	52	MSE:	0.00035065863630734384
Epoch	53	MSE:	0.0003707143187057227
Epoch	54	MSE:	0.0003144973306916654
Epoch	55	MSE:	0.0002324186934856698
Epoch	56	MSE:	0.00025681345141492784
Epoch	57	MSE:	0.00031757622491568327
Epoch	58	MSE:	0.0002972086367662996
Epoch	59	MSE:	0.0002662403858266771
Epoch	60	MSE:	0.0002886411384679377
Epoch	61	MSE:	0.0002799767826218158
Epoch	62	MSE:	0.00022245946456678212
Epoch	63	MSE:	0.00020417760242708027
Epoch	64	MSE:	0.00022448334493674338
Epoch	65	MSE:	0.00021918343554716557

```

Epoch 66 MSE: 0.00020294214482419193
Epoch 67 MSE: 0.00021530532103497535
Epoch 68 MSE: 0.00022652954794466496
Epoch 69 MSE: 0.0002064625732600689
Epoch 70 MSE: 0.00018700254440773278
Epoch 71 MSE: 0.0001885831297840923
Epoch 72 MSE: 0.00018418268882669508
Epoch 73 MSE: 0.00016963380039669573
Epoch 74 MSE: 0.00017110619228333235
Epoch 75 MSE: 0.00018059200374409556
Epoch 76 MSE: 0.00017482371185906231
Epoch 77 MSE: 0.00016625368152745068
Epoch 78 MSE: 0.00016690779011696577
Epoch 79 MSE: 0.00016216066433116794
Epoch 80 MSE: 0.00015167711535468698
Epoch 81 MSE: 0.0001503582752775401
Epoch 82 MSE: 0.0001530971931060776
Epoch 83 MSE: 0.00014954055950511247
Epoch 84 MSE: 0.00014663553156424314
Epoch 85 MSE: 0.00014764121442567557
Epoch 86 MSE: 0.00014429558359552175
Epoch 87 MSE: 0.0001380584144499153
Epoch 88 MSE: 0.0001363119954476133
Epoch 89 MSE: 0.00013554799079429358
Epoch 90 MSE: 0.00013224122812971473
Epoch 91 MSE: 0.0001310749357799068
Epoch 92 MSE: 0.0001314461842412129
Epoch 93 MSE: 0.0001287533377762884
Epoch 94 MSE: 0.00012563132622744888
Epoch 95 MSE: 0.00012446509208530188
Epoch 96 MSE: 0.00012231766595505178
Epoch 97 MSE: 0.00011973824439337477
Epoch 98 MSE: 0.00011911108595086262
Epoch 99 MSE: 0.0001183226631837897
T-time: 33.54967999458313

```

```

=====
Train Score: 0.32 RMSE
=====
Validation Score: 8.47 RMSE
=====

```

```

Epoch 0 MSE: 0.05092690885066986
Epoch 1 MSE: 0.03528755530714989
Epoch 2 MSE: 0.034432653337717056
Epoch 3 MSE: 0.03719818592071533
Epoch 4 MSE: 0.031708378344774246
Epoch 5 MSE: 0.028204036876559258

```

Epoch 6 MSE: 0.027473818510770798
Epoch 7 MSE: 0.026829559355974197
Epoch 8 MSE: 0.024692125618457794
Epoch 9 MSE: 0.02146199531853199
Epoch 10 MSE: 0.018693381920456886
Epoch 11 MSE: 0.016921963542699814
Epoch 12 MSE: 0.014287603087723255
Epoch 13 MSE: 0.009400847367942333
Epoch 14 MSE: 0.004926210734993219
Epoch 15 MSE: 0.0029466624837368727
Epoch 16 MSE: 0.00108068878762424
Epoch 17 MSE: 0.0009470731602050364
Epoch 18 MSE: 0.003914252854883671
Epoch 19 MSE: 0.004606359638273716
Epoch 20 MSE: 0.00364746549166739
Epoch 21 MSE: 0.003607851918786764
Epoch 22 MSE: 0.003527795197442174
Epoch 23 MSE: 0.002430333523079753
Epoch 24 MSE: 0.0012139625614508986
Epoch 25 MSE: 0.001152781886048615
Epoch 26 MSE: 0.0019913138821721077
Epoch 27 MSE: 0.002248132135719061
Epoch 28 MSE: 0.001854863134212792
Epoch 29 MSE: 0.0017438799841329455
Epoch 30 MSE: 0.001742288819514215
Epoch 31 MSE: 0.001456441474147141
Epoch 32 MSE: 0.0009113001287914813
Epoch 33 MSE: 0.0004532079619821161
Epoch 34 MSE: 0.00041006470564752817
Epoch 35 MSE: 0.000623503525275737
Epoch 36 MSE: 0.0006515819113701582
Epoch 37 MSE: 0.0005240674945525825
Epoch 38 MSE: 0.0005385950207710266
Epoch 39 MSE: 0.0006428777705878019
Epoch 40 MSE: 0.0005943435826338828
Epoch 41 MSE: 0.0003732202167157084
Epoch 42 MSE: 0.00024310224398504943
Epoch 43 MSE: 0.00045985489850863814
Epoch 44 MSE: 0.00043635809561237693
Epoch 45 MSE: 0.0002912674390245229
Epoch 46 MSE: 0.0003828643530141562
Epoch 47 MSE: 0.0004631921765394509
Epoch 48 MSE: 0.00032190955244004726
Epoch 49 MSE: 0.00020765083900187165
Epoch 50 MSE: 0.0002704405633267015
Epoch 51 MSE: 0.0002582975721452385
Epoch 52 MSE: 0.00015933020040392876
Epoch 53 MSE: 0.00019957638869527727

Epoch 54 MSE: 0.00026061004609800875
Epoch 55 MSE: 0.00019999359210487455
Epoch 56 MSE: 0.00015679090574849397
Epoch 57 MSE: 0.00019311797223053873
Epoch 58 MSE: 0.00016518596385139972
Epoch 59 MSE: 0.00011623600585153326
Epoch 60 MSE: 0.00014510915207210928
Epoch 61 MSE: 0.00016502727521583438
Epoch 62 MSE: 0.00013515687896870077
Epoch 63 MSE: 0.0001318279973929748
Epoch 64 MSE: 0.00015113841800484806
Epoch 65 MSE: 0.00011690441169776022
Epoch 66 MSE: 8.887537114787847e-05
Epoch 67 MSE: 0.00010365759953856468
Epoch 68 MSE: 0.0001177578087663278
Epoch 69 MSE: 9.73153582890518e-05
Epoch 70 MSE: 7.780202577123418e-05
Epoch 71 MSE: 9.15409837034531e-05
Epoch 72 MSE: 9.481146844336763e-05
Epoch 73 MSE: 7.510209979955107e-05
Epoch 74 MSE: 6.90729939378798e-05
Epoch 75 MSE: 7.939028000691906e-05
Epoch 76 MSE: 7.898031617514789e-05
Epoch 77 MSE: 6.993168062763289e-05
Epoch 78 MSE: 6.945968925720081e-05
Epoch 79 MSE: 7.491319411201403e-05
Epoch 80 MSE: 7.125816773623228e-05
Epoch 81 MSE: 6.106992805143818e-05
Epoch 82 MSE: 6.249854050111026e-05
Epoch 83 MSE: 6.611461867578328e-05
Epoch 84 MSE: 5.789220813312568e-05
Epoch 85 MSE: 5.2656992920674384e-05
Epoch 86 MSE: 5.443906775326468e-05
Epoch 87 MSE: 5.402250826591626e-05
Epoch 88 MSE: 4.8699726903578267e-05
Epoch 89 MSE: 4.6118471800582483e-05
Epoch 90 MSE: 4.7815115976845846e-05
Epoch 91 MSE: 4.5576391130452976e-05
Epoch 92 MSE: 4.1615716327214614e-05
Epoch 93 MSE: 4.067354529979639e-05
Epoch 94 MSE: 4.0941602492239326e-05
Epoch 95 MSE: 3.8483885873574764e-05
Epoch 96 MSE: 3.5707835195353255e-05
Epoch 97 MSE: 3.5689121432369575e-05
Epoch 98 MSE: 3.5227276384830475e-05
Epoch 99 MSE: 3.2907180866459385e-05
T-time: 40.497334003448486

```
=====
Train Score: 0.17 RMSE
=====
Validation Score: 0.85 RMSE
=====
```

```
=====
Time Step = 100 | Hidden States = 32 | Num Layers = 1
=====
```

```
Epoch 0 MSE: 0.04961331561207771
Epoch 1 MSE: 0.04231122508645058
Epoch 2 MSE: 0.037849485874176025
Epoch 3 MSE: 0.025049127638339996
Epoch 4 MSE: 0.019310185685753822
Epoch 5 MSE: 0.020375283434987068
Epoch 6 MSE: 0.008212931454181671
Epoch 7 MSE: 0.011695710942149162
Epoch 8 MSE: 0.004995762370526791
Epoch 9 MSE: 0.003490310860797763
Epoch 10 MSE: 0.005875629372894764
Epoch 11 MSE: 0.001654355670325458
Epoch 12 MSE: 0.004835286643356085
Epoch 13 MSE: 0.0007491392316296697
Epoch 14 MSE: 0.0006920200539752841
Epoch 15 MSE: 0.0024085610639303923
Epoch 16 MSE: 0.0021511854138225317
Epoch 17 MSE: 0.0011289742542430758
Epoch 18 MSE: 0.0010799915762618184
Epoch 19 MSE: 0.0016434910940006375
Epoch 20 MSE: 0.001534970011562109
Epoch 21 MSE: 0.0006356062949635088
Epoch 22 MSE: 0.00010212308552581817
Epoch 23 MSE: 0.0005032940534874797
Epoch 24 MSE: 0.0008823747048154473
Epoch 25 MSE: 0.0005383741809055209
Epoch 26 MSE: 0.00028884061612188816
Epoch 27 MSE: 0.0005956814275123179
Epoch 28 MSE: 0.0006837818073108792
Epoch 29 MSE: 0.0002885963476728648
Epoch 30 MSE: 4.386375439935364e-05
Epoch 31 MSE: 0.00019881351909134537
Epoch 32 MSE: 0.0003701697278302163
Epoch 33 MSE: 0.00030413747299462557
Epoch 34 MSE: 0.00017781763745006174
Epoch 35 MSE: 0.00020003480312880129
Epoch 36 MSE: 0.0002939168771263212
Epoch 37 MSE: 0.0002657690492924303
```


Epoch 38 MSE: 0.00011969820479862392
Epoch 39 MSE: 4.1886811231961474e-05
Epoch 40 MSE: 0.0001041810101014562
Epoch 41 MSE: 0.0001647861354285851
Epoch 42 MSE: 0.0001239691919181496
Epoch 43 MSE: 7.956500485306606e-05
Epoch 44 MSE: 0.00011460944369900972
Epoch 45 MSE: 0.0001443949731765315
Epoch 46 MSE: 9.533513366477564e-05
Epoch 47 MSE: 3.863906749757007e-05
Epoch 48 MSE: 4.8648067604517564e-05
Epoch 49 MSE: 8.389363210881129e-05
Epoch 50 MSE: 8.07499818620272e-05
Epoch 51 MSE: 5.697529559256509e-05
Epoch 52 MSE: 5.935883746133186e-05
Epoch 53 MSE: 7.749412179691717e-05
Epoch 54 MSE: 7.045998063404113e-05
Epoch 55 MSE: 4.2555930122034624e-05
Epoch 56 MSE: 3.349563485244289e-05
Epoch 57 MSE: 4.831198384636082e-05
Epoch 58 MSE: 5.4358843044610694e-05
Epoch 59 MSE: 4.3752952478826046e-05
Epoch 60 MSE: 4.104020990780555e-05
Epoch 61 MSE: 5.001559839001857e-05
Epoch 62 MSE: 4.8897858505370095e-05
Epoch 63 MSE: 3.602657307055779e-05
Epoch 64 MSE: 3.1525436497759074e-05
Epoch 65 MSE: 3.831116555375047e-05
Epoch 66 MSE: 4.075697506777942e-05
Epoch 67 MSE: 3.598331022658385e-05
Epoch 68 MSE: 3.513898263918236e-05
Epoch 69 MSE: 3.903851757058874e-05
Epoch 70 MSE: 3.8009744457667693e-05
Epoch 71 MSE: 3.2165520678972825e-05
Epoch 72 MSE: 3.068286969210021e-05
Epoch 73 MSE: 3.387010656297207e-05
Epoch 74 MSE: 3.426377588766627e-05
Epoch 75 MSE: 3.194983582943678e-05
Epoch 76 MSE: 3.2367828680435196e-05
Epoch 77 MSE: 3.4001193853328004e-05
Epoch 78 MSE: 3.2399901101598516e-05
Epoch 79 MSE: 2.9899736546212807e-05
Epoch 80 MSE: 3.0358747608261183e-05
Epoch 81 MSE: 3.1623556424165145e-05
Epoch 82 MSE: 3.0929604690754786e-05
Epoch 83 MSE: 3.02038333757082e-05
Epoch 84 MSE: 3.0952334782341495e-05
Epoch 85 MSE: 3.1066942028701305e-05

```

Epoch 86 MSE: 2.9759516110061668e-05
Epoch 87 MSE: 2.919752660091035e-05
Epoch 88 MSE: 2.983736339956522e-05
Epoch 89 MSE: 2.988868254760746e-05
Epoch 90 MSE: 2.9333690690691583e-05
Epoch 91 MSE: 2.9457003620336764e-05
Epoch 92 MSE: 2.973604205180891e-05
Epoch 93 MSE: 2.9213966627139598e-05
Epoch 94 MSE: 2.870261414500419e-05
Epoch 95 MSE: 2.889749885071069e-05
Epoch 96 MSE: 2.901703555835411e-05
Epoch 97 MSE: 2.8724474759656005e-05
Epoch 98 MSE: 2.8673017368419096e-05
Epoch 99 MSE: 2.882234548451379e-05
T-time: 40.045154333114624

```

```

=====
Train Score: 0.16 RMSE
=====
Validation Score: 3.41 RMSE
=====

```

```

Epoch 0 MSE: 0.04235329478979111
Epoch 1 MSE: 0.04148237779736519
Epoch 2 MSE: 0.03250628709793091
Epoch 3 MSE: 0.030720818787813187
Epoch 4 MSE: 0.029450614005327225
Epoch 5 MSE: 0.024962497875094414
Epoch 6 MSE: 0.02283196523785591
Epoch 7 MSE: 0.020952962338924408
Epoch 8 MSE: 0.016370777040719986
Epoch 9 MSE: 0.012849899008870125
Epoch 10 MSE: 0.010859186761081219
Epoch 11 MSE: 0.005938454996794462
Epoch 12 MSE: 0.0026727858930826187
Epoch 13 MSE: 0.00110047054477036
Epoch 14 MSE: 0.0015469426289200783
Epoch 15 MSE: 0.0046912748366594315
Epoch 16 MSE: 0.004475160501897335
Epoch 17 MSE: 0.0022244618739932775
Epoch 18 MSE: 0.0006728872540406883
Epoch 19 MSE: 0.0006319080712273717
Epoch 20 MSE: 0.0010196040384471416
Epoch 21 MSE: 0.0016441503539681435
Epoch 22 MSE: 0.00217806245200336
Epoch 23 MSE: 0.0020650706719607115
Epoch 24 MSE: 0.001573525951243937
Epoch 25 MSE: 0.0011379310162737966

```

Epoch 26 MSE: 0.0006503112963400781
 Epoch 27 MSE: 0.00028572860173881054
 Epoch 28 MSE: 0.000289676187094301
 Epoch 29 MSE: 0.000575780461076647
 Epoch 30 MSE: 0.0008643281762488186
 Epoch 31 MSE: 0.0009268794674426317
 Epoch 32 MSE: 0.0007625491707585752
 Epoch 33 MSE: 0.0005003939149901271
 Epoch 34 MSE: 0.000278905441518873
 Epoch 35 MSE: 0.0001862833451014012
 Epoch 36 MSE: 0.00022924055519979447
 Epoch 37 MSE: 0.00033642910420894623
 Epoch 38 MSE: 0.00042448058957234025
 Epoch 39 MSE: 0.0004511683073360473
 Epoch 40 MSE: 0.0003973634447902441
 Epoch 41 MSE: 0.0002859567175619304
 Epoch 42 MSE: 0.00017272168770432472
 Epoch 43 MSE: 0.00010270663187839091
 Epoch 44 MSE: 0.00010180022945860401
 Epoch 45 MSE: 0.00015261762018781155
 Epoch 46 MSE: 0.0001995404454646632
 Epoch 47 MSE: 0.00020378397312015295
 Epoch 48 MSE: 0.0001624852156965062
 Epoch 49 MSE: 9.970458631869406e-05
 Epoch 50 MSE: 6.210972060216591e-05
 Epoch 51 MSE: 6.275101623032242e-05
 Epoch 52 MSE: 8.620174776297063e-05
 Epoch 53 MSE: 0.00011352657020324841
 Epoch 54 MSE: 0.00012120523024350405
 Epoch 55 MSE: 0.00010342764289816841
 Epoch 56 MSE: 7.561131496913731e-05
 Epoch 57 MSE: 5.216117642703466e-05
 Epoch 58 MSE: 4.580480890581384e-05
 Epoch 59 MSE: 5.797909398097545e-05
 Epoch 60 MSE: 7.215637742774561e-05
 Epoch 61 MSE: 7.629176980117336e-05
 Epoch 62 MSE: 6.642293010372669e-05
 Epoch 63 MSE: 4.9399321142118424e-05
 Epoch 64 MSE: 3.914160333806649e-05
 Epoch 65 MSE: 3.883461977238767e-05
 Epoch 66 MSE: 4.552555765258148e-05
 Epoch 67 MSE: 5.1713388529606164e-05
 Epoch 68 MSE: 5.057349699200131e-05
 Epoch 69 MSE: 4.373801493784413e-05
 Epoch 70 MSE: 3.5309734812472016e-05
 Epoch 71 MSE: 3.078398367506452e-05
 Epoch 72 MSE: 3.227499109925702e-05
 Epoch 73 MSE: 3.5828208638122305e-05

```

Epoch 74 MSE: 3.7698406231356785e-05
Epoch 75 MSE: 3.511830072966404e-05
Epoch 76 MSE: 3.021473457920365e-05
Epoch 77 MSE: 2.6689272999647073e-05
Epoch 78 MSE: 2.6110588805750012e-05
Epoch 79 MSE: 2.799241519824136e-05
Epoch 80 MSE: 2.9258158974698745e-05
Epoch 81 MSE: 2.8568612833623774e-05
Epoch 82 MSE: 2.6086921934620477e-05
Epoch 83 MSE: 2.3641759980819188e-05
Epoch 84 MSE: 2.290473821631167e-05
Epoch 85 MSE: 2.3578233594889753e-05
Epoch 86 MSE: 2.4572851543780416e-05
Epoch 87 MSE: 2.4339824449270964e-05
Epoch 88 MSE: 2.3089078240445815e-05
Epoch 89 MSE: 2.16975840885425e-05
Epoch 90 MSE: 2.1208707039477304e-05
Epoch 91 MSE: 2.160015719709918e-05
Epoch 92 MSE: 2.2069916667533107e-05
Epoch 93 MSE: 2.1982239559292793e-05
Epoch 94 MSE: 2.1223773728706874e-05
Epoch 95 MSE: 2.0476090867305174e-05
Epoch 96 MSE: 2.0163013687124476e-05
Epoch 97 MSE: 2.0388728444231674e-05
Epoch 98 MSE: 2.060825499938801e-05
Epoch 99 MSE: 2.049726026598364e-05
T-time: 44.000553369522095

```

```

=====
Train Score: 0.14 RMSE
=====
Validation Score: 1.80 RMSE
=====

```

```

=====
Time Step = 100 | Hidden States = 32 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.05748049542307854
Epoch 1 MSE: 0.1907445639371872
Epoch 2 MSE: 0.03398081660270691
Epoch 3 MSE: 0.05354035645723343
Epoch 4 MSE: 0.05382396653294563
Epoch 5 MSE: 0.035376351326704025
Epoch 6 MSE: 0.026823725551366806
Epoch 7 MSE: 0.036674436181783676
Epoch 8 MSE: 0.03500763326883316
Epoch 9 MSE: 0.02331707440316677

```

Epoch	10	MSE:	0.019106382504105568
Epoch	11	MSE:	0.02097553014755249
Epoch	12	MSE:	0.019819794222712517
Epoch	13	MSE:	0.011947859078645706
Epoch	14	MSE:	0.004354006145149469
Epoch	15	MSE:	0.008975885808467865
Epoch	16	MSE:	0.004057454410940409
Epoch	17	MSE:	0.004951869137585163
Epoch	18	MSE:	0.008545905351638794
Epoch	19	MSE:	0.0020786274690181017
Epoch	20	MSE:	0.0012905470794066787
Epoch	21	MSE:	0.002983827143907547
Epoch	22	MSE:	0.0022207065485417843
Epoch	23	MSE:	0.0013954747701063752
Epoch	24	MSE:	0.0019393907859921455
Epoch	25	MSE:	0.0027682874351739883
Epoch	26	MSE:	0.0027245355304330587
Epoch	27	MSE:	0.0017899865051731467
Epoch	28	MSE:	0.0008544017910026014
Epoch	29	MSE:	0.0006978004821576178
Epoch	30	MSE:	0.0010141239035874605
Epoch	31	MSE:	0.0008877490763552487
Epoch	32	MSE:	0.00042523181764408946
Epoch	33	MSE:	0.0004995320923626423
Epoch	34	MSE:	0.0010210690088570118
Epoch	35	MSE:	0.0011241699103266
Epoch	36	MSE:	0.0006631024298258126
Epoch	37	MSE:	0.00030142805189825594
Epoch	38	MSE:	0.0003619993512984365
Epoch	39	MSE:	0.0004713368834927678
Epoch	40	MSE:	0.0003577501338440925
Epoch	41	MSE:	0.00023788401449564844
Epoch	42	MSE:	0.00031971532735042274
Epoch	43	MSE:	0.00047980083036236465
Epoch	44	MSE:	0.0004968976136296988
Epoch	45	MSE:	0.0003504099149722606
Epoch	46	MSE:	0.00021331929019652307
Epoch	47	MSE:	0.00020619285351131111
Epoch	48	MSE:	0.00024513847893103957
Epoch	49	MSE:	0.00020568368199747056
Epoch	50	MSE:	0.00013946136459708214
Epoch	51	MSE:	0.00016444287030026317
Epoch	52	MSE:	0.00024338994990102947
Epoch	53	MSE:	0.00025041832122951746
Epoch	54	MSE:	0.00017859529179986566
Epoch	55	MSE:	0.00013102412049192935
Epoch	56	MSE:	0.00014345847012009472
Epoch	57	MSE:	0.00015030555368866771

Epoch 58 MSE: 0.00012190359848318622
 Epoch 59 MSE: 0.00010742284939624369
 Epoch 60 MSE: 0.00013256329111754894
 Epoch 61 MSE: 0.00015607695968355983
 Epoch 62 MSE: 0.0001420268090441823
 Epoch 63 MSE: 0.00011229531810386106
 Epoch 64 MSE: 0.00010382018808741122
 Epoch 65 MSE: 0.00011044740676879883
 Epoch 66 MSE: 0.00010413186100777239
 Epoch 67 MSE: 8.995588723337278e-05
 Epoch 68 MSE: 9.267980931326747e-05
 Epoch 69 MSE: 0.00010698170808609575
 Epoch 70 MSE: 0.0001074887186405249
 Epoch 71 MSE: 9.382289135828614e-05
 Epoch 72 MSE: 8.661529864184558e-05
 Epoch 73 MSE: 8.905716822482646e-05
 Epoch 74 MSE: 8.7040985818021e-05
 Epoch 75 MSE: 7.995298074092716e-05
 Epoch 76 MSE: 7.970364094944671e-05
 Epoch 77 MSE: 8.570306818000972e-05
 Epoch 78 MSE: 8.637834980618209e-05
 Epoch 79 MSE: 8.032078767428175e-05
 Epoch 80 MSE: 7.659263064851984e-05
 Epoch 81 MSE: 7.720592839177698e-05
 Epoch 82 MSE: 7.580759120173752e-05
 Epoch 83 MSE: 7.20735260983929e-05
 Epoch 84 MSE: 7.178141822805628e-05
 Epoch 85 MSE: 7.430541882058606e-05
 Epoch 86 MSE: 7.389291567960754e-05
 Epoch 87 MSE: 7.071471191011369e-05
 Epoch 88 MSE: 6.92711619194597e-05
 Epoch 89 MSE: 6.930054951226339e-05
 Epoch 90 MSE: 6.780679541407153e-05
 Epoch 91 MSE: 6.597751780645922e-05
 Epoch 92 MSE: 6.622350338147953e-05
 Epoch 93 MSE: 6.691143789794296e-05
 Epoch 94 MSE: 6.580920307897031e-05
 Epoch 95 MSE: 6.422309525078163e-05
 Epoch 96 MSE: 6.374516669893637e-05
 Epoch 97 MSE: 6.325939466478303e-05
 Epoch 98 MSE: 6.199551717145368e-05
 Epoch 99 MSE: 6.127332744654268e-05
 T-time: 68.60026049613953

=====

Train Score: 0.23 RMSE

=====

Validation Score: 6.31 RMSE

=====

Epoch 0 MSE: 0.08087299019098282
Epoch 1 MSE: 0.03580334782600403
Epoch 2 MSE: 0.051343366503715515
Epoch 3 MSE: 0.04179958254098892
Epoch 4 MSE: 0.03351326286792755
Epoch 5 MSE: 0.031329404562711716
Epoch 6 MSE: 0.03148583695292473
Epoch 7 MSE: 0.031184352934360504
Epoch 8 MSE: 0.029072392731904984
Epoch 9 MSE: 0.025387607514858246
Epoch 10 MSE: 0.021982882171869278
Epoch 11 MSE: 0.02050633355975151
Epoch 12 MSE: 0.02020001783967018
Epoch 13 MSE: 0.014215677976608276
Epoch 14 MSE: 0.008556066080927849
Epoch 15 MSE: 0.005473265424370766
Epoch 16 MSE: 0.0028886711224913597
Epoch 17 MSE: 0.00040150026325136423
Epoch 18 MSE: 0.005129105877131224
Epoch 19 MSE: 0.004170436877757311
Epoch 20 MSE: 0.00310357753187418
Epoch 21 MSE: 0.00411528954282403
Epoch 22 MSE: 0.003285537241026759
Epoch 23 MSE: 0.0011851469753310084
Epoch 24 MSE: 0.0004039251944050193
Epoch 25 MSE: 0.0021105969790369272
Epoch 26 MSE: 0.002397578675299883
Epoch 27 MSE: 0.0011009302688762546
Epoch 28 MSE: 0.0010719405254349113
Epoch 29 MSE: 0.0017189482459798455
Epoch 30 MSE: 0.0017011506715789437
Epoch 31 MSE: 0.000935732270590961
Epoch 32 MSE: 0.0002436516952002421
Epoch 33 MSE: 0.00042543496238067746
Epoch 34 MSE: 0.0009488478535786271
Epoch 35 MSE: 0.0006745128775946796
Epoch 36 MSE: 0.0001924145472003147
Epoch 37 MSE: 0.0003221024526283145
Epoch 38 MSE: 0.0006468025385402143
Epoch 39 MSE: 0.0005706902011297643
Epoch 40 MSE: 0.0002002580586122349
Epoch 41 MSE: 0.0001103943504858762
Epoch 42 MSE: 0.0004130940942559391
Epoch 43 MSE: 0.00042720072087831795
Epoch 44 MSE: 0.00016218294331338257
Epoch 45 MSE: 0.00014258033479563892

Epoch	46	MSE:	0.00031479651806876063
Epoch	47	MSE:	0.0003152928838972002
Epoch	48	MSE:	0.00013648565800394863
Epoch	49	MSE:	8.336199971381575e-05
Epoch	50	MSE:	0.00021412860951386392
Epoch	51	MSE:	0.00022793276002630591
Epoch	52	MSE:	0.0001040798015310429
Epoch	53	MSE:	9.922678873408586e-05
Epoch	54	MSE:	0.0001821752084651962
Epoch	55	MSE:	0.00016587189747951925
Epoch	56	MSE:	7.995316991582513e-05
Epoch	57	MSE:	8.099137630779296e-05
Epoch	58	MSE:	0.00014096770610194653
Epoch	59	MSE:	0.00011969777551712468
Epoch	60	MSE:	6.82939135003835e-05
Epoch	61	MSE:	8.776311005931348e-05
Epoch	62	MSE:	0.00011774839367717505
Epoch	63	MSE:	8.935591176850721e-05
Epoch	64	MSE:	5.757935286965221e-05
Epoch	65	MSE:	7.800303865224123e-05
Epoch	66	MSE:	9.268551366403699e-05
Epoch	67	MSE:	6.584578659385443e-05
Epoch	68	MSE:	5.7584689784562215e-05
Epoch	69	MSE:	7.670072955079377e-05
Epoch	70	MSE:	7.337648276006803e-05
Epoch	71	MSE:	5.25620453117881e-05
Epoch	72	MSE:	5.538268669624813e-05
Epoch	73	MSE:	6.709248555125669e-05
Epoch	74	MSE:	5.644110933644697e-05
Epoch	75	MSE:	4.797702786163427e-05
Epoch	76	MSE:	5.689889076165855e-05
Epoch	77	MSE:	5.73463476030156e-05
Epoch	78	MSE:	4.6331973862834275e-05
Epoch	79	MSE:	4.661304774344899e-05
Epoch	80	MSE:	5.233173578744754e-05
Epoch	81	MSE:	4.665992673835717e-05
Epoch	82	MSE:	4.2415238567627966e-05
Epoch	83	MSE:	4.695963434642181e-05
Epoch	84	MSE:	4.60598457721062e-05
Epoch	85	MSE:	4.035587335238233e-05
Epoch	86	MSE:	4.1476690967101604e-05
Epoch	87	MSE:	4.3302541598677635e-05
Epoch	88	MSE:	3.9350172301055863e-05
Epoch	89	MSE:	3.836225369013846e-05
Epoch	90	MSE:	4.04716374760028e-05
Epoch	91	MSE:	3.834975359495729e-05
Epoch	92	MSE:	3.59980040229857e-05
Epoch	93	MSE:	3.728302908712067e-05


```
Epoch 94 MSE: 3.6579236621037126e-05
Epoch 95 MSE: 3.4328779292991385e-05
Epoch 96 MSE: 3.4856384445447475e-05
Epoch 97 MSE: 3.484273111098446e-05
Epoch 98 MSE: 3.2855969038791955e-05
Epoch 99 MSE: 3.257604475948028e-05
T-time: 140.92648124694824
```

```
=====
Train Score: 0.17 RMSE
=====
Validation Score: 1.11 RMSE
=====
```

```
[25]: tanh_results = pd.DataFrame(tanh_results, columns=['time_step', 'num_layers', '
      ↪ 'hidden_dim', 'trainScore', 'valScore'], index = None)
      relu_results = pd.DataFrame(relu_results, columns=['time_step', 'num_layers', '
      ↪ 'hidden_dim', 'trainScore', 'valScore'], index = None)
```

```
[26]: tanh_results = tanh_results.sort_values('valScore', ascending=True,
      ↪ ignore_index = True)
      tanh_results
```

```
[26]:
```

	time_step	num_layers	hidden_dim	trainScore	valScore
0	20.0	1.0	32.0	0.157601	3.239338
1	30.0	1.0	32.0	0.158502	3.263731
2	50.0	1.0	32.0	0.159220	3.302811
3	100.0	1.0	32.0	0.160202	3.406101
4	20.0	1.0	16.0	0.190952	4.905224
5	30.0	1.0	16.0	0.191295	4.934485
6	50.0	1.0	16.0	0.191400	4.976959
7	100.0	1.0	16.0	0.191759	5.091980
8	20.0	2.0	32.0	0.234232	6.114390
9	30.0	2.0	32.0	0.233431	6.126396
10	50.0	2.0	32.0	0.233398	6.173006
11	100.0	2.0	32.0	0.233582	6.307074
12	20.0	1.0	8.0	0.189662	6.405687
13	30.0	1.0	8.0	0.192436	6.439338
14	50.0	1.0	8.0	0.192422	6.496586
15	100.0	1.0	8.0	0.192664	6.647655
16	20.0	1.0	2.0	0.214332	7.186258
17	30.0	1.0	2.0	0.214289	7.219084
18	50.0	1.0	2.0	0.214202	7.287281
19	100.0	1.0	2.0	0.213989	7.468269
20	20.0	2.0	16.0	0.323674	8.185782
21	30.0	2.0	16.0	0.323771	8.214138

22	50.0	2.0	16.0	0.324007	8.281423
23	100.0	2.0	16.0	0.324592	8.468461
24	20.0	2.0	8.0	0.261688	8.877346
25	30.0	2.0	8.0	0.261400	8.907015
26	50.0	2.0	8.0	0.261373	8.980628
27	100.0	2.0	8.0	0.261374	9.182593
28	20.0	1.0	4.0	0.306535	9.999781
29	30.0	1.0	4.0	0.306323	10.037119
30	20.0	2.0	4.0	0.403289	10.109327
31	50.0	1.0	4.0	0.305934	10.116324
32	30.0	2.0	4.0	0.403421	10.150412
33	50.0	2.0	4.0	0.403689	10.237104
34	100.0	1.0	4.0	0.304992	10.335959
35	100.0	2.0	4.0	0.404363	10.476549
36	20.0	2.0	2.0	1.492525	18.716492
37	30.0	2.0	2.0	1.492423	18.771202
38	50.0	2.0	2.0	1.492223	18.888865
39	100.0	2.0	2.0	1.491707	19.245143

```
[27]: relu_results = relu_results.sort_values('valScore', ascending=True,
      ↪ ignore_index = True)
      relu_results
```

	time_step	num_layers	hidden_dim	trainScore	valScore
0	20.0	2.0	32.0	0.133012	0.831369
1	100.0	2.0	16.0	0.171179	0.846573
2	30.0	2.0	32.0	0.144437	1.044344
3	50.0	2.0	32.0	0.154867	1.069251
4	100.0	2.0	32.0	0.170315	1.112106
5	20.0	1.0	2.0	0.485984	1.162175
6	30.0	1.0	2.0	0.486454	1.162243
7	100.0	1.0	2.0	0.488971	1.163013
8	20.0	2.0	2.0	0.223151	1.163247
9	50.0	1.0	2.0	0.487123	1.164787
10	30.0	2.0	2.0	0.223139	1.169142
11	50.0	2.0	2.0	0.223081	1.179064
12	100.0	2.0	2.0	0.223021	1.192291
13	20.0	1.0	16.0	0.183820	1.420421
14	30.0	1.0	16.0	0.184569	1.441064
15	50.0	1.0	16.0	0.185803	1.478651
16	100.0	1.0	16.0	0.186830	1.513478
17	100.0	1.0	32.0	0.135099	1.798861
18	20.0	1.0	32.0	0.144630	1.800635
19	50.0	1.0	32.0	0.148120	1.835724
20	30.0	1.0	32.0	0.157291	2.007290
21	30.0	1.0	8.0	0.136792	2.007576
22	50.0	1.0	8.0	0.136531	2.066542

23	20.0	1.0	8.0	0.135812	2.070019
24	100.0	1.0	8.0	0.136900	2.159652
25	20.0	2.0	16.0	0.219959	2.293014
26	30.0	2.0	16.0	0.221940	2.300989
27	50.0	2.0	16.0	0.223492	2.315893
28	20.0	2.0	4.0	0.121351	5.846859
29	30.0	2.0	4.0	0.121407	5.875183
30	50.0	2.0	4.0	0.121519	5.933123
31	100.0	2.0	4.0	0.121753	6.084521
32	20.0	2.0	8.0	0.289726	6.894939
33	30.0	2.0	8.0	0.291008	6.938869
34	100.0	2.0	8.0	0.275730	6.964060
35	50.0	2.0	8.0	0.290500	6.999930
36	20.0	1.0	4.0	4.668379	29.531164
37	30.0	1.0	4.0	4.672350	29.592619
38	50.0	1.0	4.0	4.680345	29.726151
39	100.0	1.0	4.0	4.700520	30.148492

0.9 Selecting best model (Vanilla RNN with ReLU)

```
[28]: best_rnn_model = relu_results.iloc[0]
      best_rnn_model
```

```
[28]: time_step      20.000000
      num_layers      2.000000
      hidden_dim     32.000000
      trainScore      0.133012
      valScore        0.831369
      Name: 0, dtype: float64
```

```
[29]: input_dim = 1
      output_dim = 1
      num_epochs = 100
      lr = 0.01
      loss_type = torch.nn.MSELoss(reduction='mean')
      optimiser = torch.optim.Adam

      hidden_dim = int(best_rnn_model['hidden_dim'])
      num_layers = int(best_rnn_model['num_layers'])
      time_step = int(best_rnn_model['time_step'])

      torch.manual_seed(42)
      tuned_rnn = RNN_relu(input_dim = input_dim, hidden_dim = hidden_dim, output_dim=
      ↪ output_dim, layer_dim = num_layers)
      tuned_rnn = to_device(tuned_rnn, device)
```

```
evaluate_single_model(tuned_rnn, num_epochs, lr, loss_type, optimiser, ␣  
    ↪time_step)
```

```
Epoch 0 MSE: 0.08024495095014572  
Epoch 1 MSE: 0.03558538109064102  
Epoch 2 MSE: 0.0503331758081913  
Epoch 3 MSE: 0.04169435054063797  
Epoch 4 MSE: 0.03350633382797241  
Epoch 5 MSE: 0.031117025762796402  
Epoch 6 MSE: 0.031270455569028854  
Epoch 7 MSE: 0.03104744292795658  
Epoch 8 MSE: 0.029027357697486877  
Epoch 9 MSE: 0.02533632703125477  
Epoch 10 MSE: 0.021798761561512947  
Epoch 11 MSE: 0.02015637420117855  
Epoch 12 MSE: 0.0201789028942585  
Epoch 13 MSE: 0.014230762608349323  
Epoch 14 MSE: 0.008676717057824135  
Epoch 15 MSE: 0.006079191341996193  
Epoch 16 MSE: 0.003683346090838313  
Epoch 17 MSE: 0.0006208492559380829  
Epoch 18 MSE: 0.004154627211391926  
Epoch 19 MSE: 0.004882219713181257  
Epoch 20 MSE: 0.002827702322974801  
Epoch 21 MSE: 0.003504342632368207  
Epoch 22 MSE: 0.0034184579271823168  
Epoch 23 MSE: 0.0017453309847041965  
Epoch 24 MSE: 0.0005337395123206079  
Epoch 25 MSE: 0.0013181816320866346  
Epoch 26 MSE: 0.002431813394650817  
Epoch 27 MSE: 0.002032879274338484  
Epoch 28 MSE: 0.0012406788300722837  
Epoch 29 MSE: 0.001183325075544417  
Epoch 30 MSE: 0.0014736357843503356  
Epoch 31 MSE: 0.0013759627472609282  
Epoch 32 MSE: 0.0007443660870194435  
Epoch 33 MSE: 0.00014996422396507114  
Epoch 34 MSE: 0.00028573846793733537  
Epoch 35 MSE: 0.0007765700574964285  
Epoch 36 MSE: 0.000618414138443768  
Epoch 37 MSE: 0.00021101327729411423  
Epoch 38 MSE: 0.0002916563826147467  
Epoch 39 MSE: 0.0005375298205763102  
Epoch 40 MSE: 0.0004483023367356509  
Epoch 41 MSE: 0.00012213132868055254  
Epoch 42 MSE: 0.0001581912365509197  
Epoch 43 MSE: 0.00046684592962265015  
Epoch 44 MSE: 0.00022419630840886384
```

Epoch 45 MSE: 8.901473484002054e-05
 Epoch 46 MSE: 0.00025506390375085175
 Epoch 47 MSE: 0.0002659439924173057
 Epoch 48 MSE: 0.00010108391870744526
 Epoch 49 MSE: 5.79161242058035e-05
 Epoch 50 MSE: 0.00018963411275763065
 Epoch 51 MSE: 0.0001914934255182743
 Epoch 52 MSE: 6.727626896463335e-05
 Epoch 53 MSE: 6.736813520547003e-05
 Epoch 54 MSE: 0.0001427126699127257
 Epoch 55 MSE: 0.0001256572868442163
 Epoch 56 MSE: 4.880207052337937e-05
 Epoch 57 MSE: 5.5134787544375286e-05
 Epoch 58 MSE: 0.00011268393427599221
 Epoch 59 MSE: 9.053738176589832e-05
 Epoch 60 MSE: 4.051646828884259e-05
 Epoch 61 MSE: 5.857679934706539e-05
 Epoch 62 MSE: 8.658769365865737e-05
 Epoch 63 MSE: 6.191692227730528e-05
 Epoch 64 MSE: 3.3862317650346085e-05
 Epoch 65 MSE: 5.3126677812542766e-05
 Epoch 66 MSE: 6.932936230441555e-05
 Epoch 67 MSE: 4.5448698074324057e-05
 Epoch 68 MSE: 3.396104875719175e-05
 Epoch 69 MSE: 5.025982318329625e-05
 Epoch 70 MSE: 5.2327803132357076e-05
 Epoch 71 MSE: 3.4172127925558016e-05
 Epoch 72 MSE: 3.1567116820951924e-05
 Epoch 73 MSE: 4.456937676877715e-05
 Epoch 74 MSE: 3.967718657804653e-05
 Epoch 75 MSE: 2.7792331820819527e-05
 Epoch 76 MSE: 3.262158497818746e-05
 Epoch 77 MSE: 3.765518340514973e-05
 Epoch 78 MSE: 2.936461714853067e-05
 Epoch 79 MSE: 2.48701217060443e-05
 Epoch 80 MSE: 3.105514406342991e-05
 Epoch 81 MSE: 3.0276685720309615e-05
 Epoch 82 MSE: 2.3680069716647267e-05
 Epoch 83 MSE: 2.5393228497705422e-05
 Epoch 84 MSE: 2.8241129257366993e-05
 Epoch 85 MSE: 2.3966947992448695e-05
 Epoch 86 MSE: 2.1963602193864062e-05
 Epoch 87 MSE: 2.5264771466027014e-05
 Epoch 88 MSE: 2.4164741262211464e-05
 Epoch 89 MSE: 2.1144418496987782e-05
 Epoch 90 MSE: 2.2795939003117383e-05
 Epoch 91 MSE: 2.3507613150286488e-05
 Epoch 92 MSE: 2.094406409014482e-05

```

Epoch 93 MSE: 2.10711732506752e-05
Epoch 94 MSE: 2.2501160856336355e-05
Epoch 95 MSE: 2.1023724912083708e-05
Epoch 96 MSE: 2.0319546820246615e-05
Epoch 97 MSE: 2.1516820197575726e-05
Epoch 98 MSE: 2.0886549464194104e-05
Epoch 99 MSE: 1.986884126381483e-05
T-time: 15.593940258026123

```

```

=====
Train Score: 0.13 RMSE
=====
Validation Score: 0.83 RMSE
=====

```



0.10 Model Architecture (LSTM)

```

[30]: class LSTM_model(nn.Module):
        def __init__(self, input_dim, hidden_dim, layer_dim, output_dim):
            super(LSTM_model, self).__init__()
            self.hidden_dim = hidden_dim
            self.layer_dim = layer_dim

```

```

self.lstm = nn.LSTM(input_dim, hidden_dim, layer_dim, batch_first=True)
self.fc = nn.Linear(hidden_dim, output_dim)

def forward(self, x):
    h0 = Variable(torch.zeros(self.layer_dim, x.size(0), self.hidden_dim,
↪device = device))
    c0 = Variable(torch.zeros(self.layer_dim, x.size(0), self.hidden_dim,
↪device = device))
    out, (hn, cn) = self.lstm(x, (h0.detach(), c0.detach()))
    out = self.fc(out[:, -1, :])
    return out

```

```

[31]: gc.collect()
      torch.cuda.empty_cache()

```

0.11 LSTM Model

```

[32]: input_dim = 1
      output_dim = 1
      num_epochs = 100
      lr = 0.01
      loss_type = torch.nn.MSELoss(reduction = 'mean')
      optimiser = torch.optim.Adam

      hidden_dim = int(best_rnn_model['hidden_dim'])
      num_layers = int(best_rnn_model['num_layers'])
      time_step = int(best_rnn_model['time_step'])

      torch.manual_seed(42)
      lstm_1 = LSTM_model(input_dim = input_dim, hidden_dim = hidden_dim, output_dim,
↪= output_dim, layer_dim = num_layers)
      lstm_1 = to_device(lstm_1, device)

      evaluate_single_model(lstm_1, num_epochs, lr, loss_type, optimiser, time_step)

```

```

Epoch 0 MSE: 0.040618978440761566
Epoch 1 MSE: 0.04281147941946983
Epoch 2 MSE: 0.036195024847984314
Epoch 3 MSE: 0.03292616829276085
Epoch 4 MSE: 0.032557085156440735
Epoch 5 MSE: 0.030960144475102425
Epoch 6 MSE: 0.026295436546206474
Epoch 7 MSE: 0.019574686884880066
Epoch 8 MSE: 0.014389541931450367
Epoch 9 MSE: 0.007475757040083408
Epoch 10 MSE: 0.0008210205123759806
Epoch 11 MSE: 0.010090870782732964
Epoch 12 MSE: 0.0070607322268188

```

Epoch	13	MSE:	0.0018260730430483818
Epoch	14	MSE:	0.0007192532648332417
Epoch	15	MSE:	0.001957071479409933
Epoch	16	MSE:	0.0034813072998076677
Epoch	17	MSE:	0.0039337510243058205
Epoch	18	MSE:	0.0032134391367435455
Epoch	19	MSE:	0.0019866065122187138
Epoch	20	MSE:	0.0012014649109914899
Epoch	21	MSE:	0.0009045402985066175
Epoch	22	MSE:	0.000983517151325941
Epoch	23	MSE:	0.0015868934569880366
Epoch	24	MSE:	0.00186759268399328
Epoch	25	MSE:	0.0017075836658477783
Epoch	26	MSE:	0.0013904622755944729
Epoch	27	MSE:	0.0008669569506309927
Epoch	28	MSE:	0.0005355679895728827
Epoch	29	MSE:	0.0005577965057455003
Epoch	30	MSE:	0.0007416111184284091
Epoch	31	MSE:	0.000952484377194196
Epoch	32	MSE:	0.0010651820339262486
Epoch	33	MSE:	0.000964015256613493
Epoch	34	MSE:	0.0007188546005636454
Epoch	35	MSE:	0.000508075871039182
Epoch	36	MSE:	0.0004137598443776369
Epoch	37	MSE:	0.0004381434991955757
Epoch	38	MSE:	0.00054739456390962
Epoch	39	MSE:	0.0006173465517349541
Epoch	40	MSE:	0.0005628871149383485
Epoch	41	MSE:	0.00044543895637616515
Epoch	42	MSE:	0.00032515102066099644
Epoch	43	MSE:	0.0002531992504373193
Epoch	44	MSE:	0.0002722999488469213
Epoch	45	MSE:	0.0003296692157164216
Epoch	46	MSE:	0.00035123637644574046
Epoch	47	MSE:	0.00033084998722188175
Epoch	48	MSE:	0.00027451166533865035
Epoch	49	MSE:	0.00020464873523451388
Epoch	50	MSE:	0.00017633654351811856
Epoch	51	MSE:	0.0001937545748660341
Epoch	52	MSE:	0.00021363218547776341
Epoch	53	MSE:	0.00022324759629555047
Epoch	54	MSE:	0.00020291823602747172
Epoch	55	MSE:	0.00015792869089636952
Epoch	56	MSE:	0.00013213518832344562
Epoch	57	MSE:	0.00013046184903942049
Epoch	58	MSE:	0.00013931546709500253
Epoch	59	MSE:	0.00015011505456641316
Epoch	60	MSE:	0.00014165484753903002


```

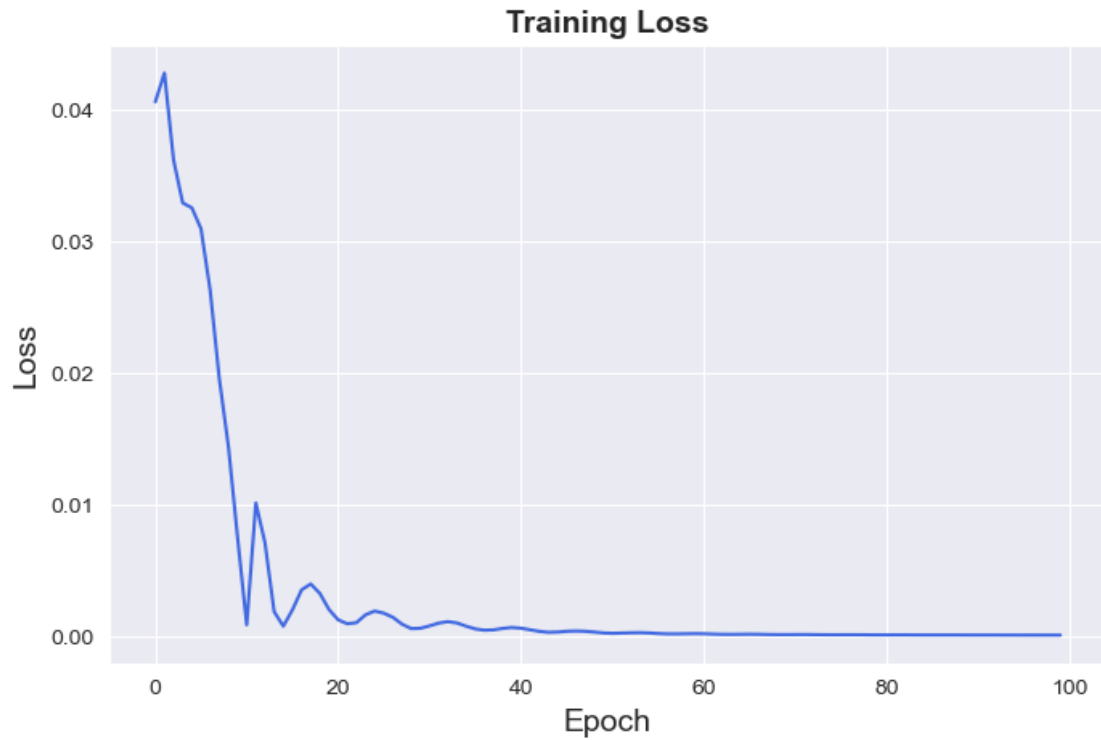
Epoch 61 MSE: 0.00011667511716950685
Epoch 62 MSE: 9.995536674978212e-05
Epoch 63 MSE: 9.635627793613821e-05
Epoch 64 MSE: 0.00010215606016572565
Epoch 65 MSE: 0.00010930553253274411
Epoch 66 MSE: 0.0001021002244669944
Epoch 67 MSE: 8.75506448210217e-05
Epoch 68 MSE: 7.922462100395933e-05
Epoch 69 MSE: 7.783198816468939e-05
Epoch 70 MSE: 8.237096335506067e-05
Epoch 71 MSE: 8.350572170456871e-05
Epoch 72 MSE: 7.578958320664242e-05
Epoch 73 MSE: 6.776477675884962e-05
Epoch 74 MSE: 6.405951717169955e-05
Epoch 75 MSE: 6.484367622761056e-05
Epoch 76 MSE: 6.721611134707928e-05
Epoch 77 MSE: 6.424181628972292e-05
Epoch 78 MSE: 5.865002458449453e-05
Epoch 79 MSE: 5.511551717063412e-05
Epoch 80 MSE: 5.4543936130357906e-05
Epoch 81 MSE: 5.61417436983902e-05
Epoch 82 MSE: 5.509438778972253e-05
Epoch 83 MSE: 5.172540477360599e-05
Epoch 84 MSE: 4.908813934889622e-05
Epoch 85 MSE: 4.818529851036146e-05
Epoch 86 MSE: 4.9039434088626876e-05
Epoch 87 MSE: 4.837533560930751e-05
Epoch 88 MSE: 4.616101068677381e-05
Epoch 89 MSE: 4.4178199459565803e-05
Epoch 90 MSE: 4.345014167483896e-05
Epoch 91 MSE: 4.385017746244557e-05
Epoch 92 MSE: 4.3200554500799626e-05
Epoch 93 MSE: 4.1761846659937873e-05
Epoch 94 MSE: 4.043874650960788e-05
Epoch 95 MSE: 4.012057252111845e-05
Epoch 96 MSE: 4.0292685298481956e-05
Epoch 97 MSE: 3.9715570892440155e-05
Epoch 98 MSE: 3.875664697261527e-05
Epoch 99 MSE: 3.797909812419675e-05
T-time: 38.01822757720947

```

```

=====
Train Score: 0.18 RMSE
=====
Validation Score: 3.35 RMSE
=====

```



```
[33]: gc.collect()
      torch.cuda.empty_cache()
```

0.12 Hyper Parameter Tuning

```
[34]: input_dim = 1
      output_dim = 1
      num_epochs = 100
      lr = 0.01
      loss_type = torch.nn.MSELoss(reduction = 'mean')
      optimiser = torch.optim.Adam

      num_layers = [1, 2]
      sliding_windows = [20, 30, 50, 100]
      hidden_dims = [2, 4, 8, 16, 32]

      LSTM_results=[]

      for time_step in sliding_windows:
          for hidden_dim in hidden_dims:
              for layers in num_layers:

                  gc.collect()
```

```

torch.cuda.empty_cache()

print("=====")
print("Time Step =", time_step, "| Hidden States =", hidden_dim, "| Num Layers =", layers)
print("=====")
print()

torch.manual_seed(42)
lstm_exp = LSTM_model(input_dim = input_dim, hidden_dim = hidden_dim, output_dim = output_dim, layer_dim = layers)
lstm_exp = to_device(lstm_exp, device)

LSTM_res = evaluate_model_experiments(lstm_exp, num_epochs, lr, loss_type, optimiser, time_step)
LSTM_results += [LSTM_res.iloc[0]]
print()

```

```

=====
Time Step = 20 | Hidden States = 2 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.09312347322702408
Epoch 1 MSE: 0.08503765612840652
Epoch 2 MSE: 0.07806186378002167
Epoch 3 MSE: 0.0720396339893341
Epoch 4 MSE: 0.06683067977428436
Epoch 5 MSE: 0.06231401860713959
Epoch 6 MSE: 0.058388471603393555
Epoch 7 MSE: 0.05497036874294281
Epoch 8 MSE: 0.05199102312326431
Epoch 9 MSE: 0.04939426854252815
Epoch 10 MSE: 0.047134049236774445
Epoch 11 MSE: 0.04517238214612007
Epoch 12 MSE: 0.043477535247802734
Epoch 13 MSE: 0.042022496461868286
Epoch 14 MSE: 0.04078375920653343
Epoch 15 MSE: 0.039740364998579025
Epoch 16 MSE: 0.03887315094470978
Epoch 17 MSE: 0.038164205849170685
Epoch 18 MSE: 0.03759652003645897
Epoch 19 MSE: 0.037153735756874084
Epoch 20 MSE: 0.03682004287838936
Epoch 21 MSE: 0.0365801565349102
Epoch 22 MSE: 0.036419350653886795
Epoch 23 MSE: 0.03632358834147453
Epoch 24 MSE: 0.03627965226769447

```

Epoch	25	MSE:	0.03627524897456169
Epoch	26	MSE:	0.0362992100417614
Epoch	27	MSE:	0.03634156659245491
Epoch	28	MSE:	0.0363936722278595
Epoch	29	MSE:	0.03644823282957077
Epoch	30	MSE:	0.03649933263659477
Epoch	31	MSE:	0.03654240071773529
Epoch	32	MSE:	0.03657414764165878
Epoch	33	MSE:	0.03659243509173393
Epoch	34	MSE:	0.03659617528319359
Epoch	35	MSE:	0.03658517450094223
Epoch	36	MSE:	0.03655995428562164
Epoch	37	MSE:	0.03652162104845047
Epoch	38	MSE:	0.0364716574549675
Epoch	39	MSE:	0.0364118255674839
Epoch	40	MSE:	0.03634398803114891
Epoch	41	MSE:	0.03627000376582146
Epoch	42	MSE:	0.03619164600968361
Epoch	43	MSE:	0.03611047938466072
Epoch	44	MSE:	0.036027852445840836
Epoch	45	MSE:	0.03594481572508812
Epoch	46	MSE:	0.03586212173104286
Epoch	47	MSE:	0.035780224949121475
Epoch	48	MSE:	0.035699255764484406
Epoch	49	MSE:	0.035619061440229416
Epoch	50	MSE:	0.03553924337029457
Epoch	51	MSE:	0.03545915335416794
Epoch	52	MSE:	0.03537796065211296
Epoch	53	MSE:	0.035294659435749054
Epoch	54	MSE:	0.03520810604095459
Epoch	55	MSE:	0.03511705622076988
Epoch	56	MSE:	0.03502017632126808
Epoch	57	MSE:	0.03491605818271637
Epoch	58	MSE:	0.03480321168899536
Epoch	59	MSE:	0.0346800871193409
Epoch	60	MSE:	0.03454504534602165
Epoch	61	MSE:	0.034396328032016754
Epoch	62	MSE:	0.03423202410340309
Epoch	63	MSE:	0.03405003249645233
Epoch	64	MSE:	0.03384796902537346
Epoch	65	MSE:	0.033623140305280685
Epoch	66	MSE:	0.033372413367033005
Epoch	67	MSE:	0.03309211879968643
Epoch	68	MSE:	0.03277793526649475
Epoch	69	MSE:	0.03242475166916847
Epoch	70	MSE:	0.032026488333940506
Epoch	71	MSE:	0.03157590329647064
Epoch	72	MSE:	0.03106437437236309

```

Epoch 73 MSE: 0.030481664463877678
Epoch 74 MSE: 0.02981564588844776
Epoch 75 MSE: 0.029052045196294785
Epoch 76 MSE: 0.028174251317977905
Epoch 77 MSE: 0.027163276448845863
Epoch 78 MSE: 0.025998102501034737
Epoch 79 MSE: 0.02465655282139778
Epoch 80 MSE: 0.023117046803236008
Epoch 81 MSE: 0.021361498162150383
Epoch 82 MSE: 0.019379764795303345
Epoch 83 MSE: 0.017175637185573578
Epoch 84 MSE: 0.014774050563573837
Epoch 85 MSE: 0.012228799983859062
Epoch 86 MSE: 0.009630962274968624
Epoch 87 MSE: 0.007118766196072102
Epoch 88 MSE: 0.004888874478638172
Epoch 89 MSE: 0.003196943551301956
Epoch 90 MSE: 0.002307554939761758
Epoch 91 MSE: 0.0023410769645124674
Epoch 92 MSE: 0.0030904854647815228
Epoch 93 MSE: 0.004101990722119808
Epoch 94 MSE: 0.004962090868502855
Epoch 95 MSE: 0.00533760292455554
Epoch 96 MSE: 0.005040076095610857
Epoch 97 MSE: 0.004229704849421978
Epoch 98 MSE: 0.0032733476255089045
Epoch 99 MSE: 0.002437604358419776
T-time: 3.1610684394836426

```

```

=====
Train Score: 1.47 RMSE
=====
Validation Score: 16.39 RMSE
=====

```

```

=====
Time Step = 20 | Hidden States = 2 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.03741060569882393
Epoch 1 MSE: 0.03556329756975174
Epoch 2 MSE: 0.034476738423109055
Epoch 3 MSE: 0.034121859818696976
Epoch 4 MSE: 0.03401393070816994
Epoch 5 MSE: 0.03354020044207573
Epoch 6 MSE: 0.03255666792392731
Epoch 7 MSE: 0.031215161085128784
Epoch 8 MSE: 0.029733188450336456

```

Epoch 9 MSE: 0.028329679742455482
Epoch 10 MSE: 0.027070775628089905
Epoch 11 MSE: 0.02563047595322132
Epoch 12 MSE: 0.023624664172530174
Epoch 13 MSE: 0.02111716754734516
Epoch 14 MSE: 0.018670404329895973
Epoch 15 MSE: 0.016784844920039177
Epoch 16 MSE: 0.014772159047424793
Epoch 17 MSE: 0.011975259520113468
Epoch 18 MSE: 0.009322406724095345
Epoch 19 MSE: 0.008011757396161556
Epoch 20 MSE: 0.006455334834754467
Epoch 21 MSE: 0.0053104860708117485
Epoch 22 MSE: 0.005635484121739864
Epoch 23 MSE: 0.005105094984173775
Epoch 24 MSE: 0.006002330686897039
Epoch 25 MSE: 0.005842443555593491
Epoch 26 MSE: 0.00595932686701417
Epoch 27 MSE: 0.005818617530167103
Epoch 28 MSE: 0.004967294167727232
Epoch 29 MSE: 0.004364573862403631
Epoch 30 MSE: 0.003722385736182332
Epoch 31 MSE: 0.002884102752432227
Epoch 32 MSE: 0.002287705661728978
Epoch 33 MSE: 0.0020101089030504227
Epoch 34 MSE: 0.0018945704214274883
Epoch 35 MSE: 0.0018744965782389045
Epoch 36 MSE: 0.0019543233793228865
Epoch 37 MSE: 0.0021019543055444956
Epoch 38 MSE: 0.0022341059520840645
Epoch 39 MSE: 0.0022771162912249565
Epoch 40 MSE: 0.002214409876614809
Epoch 41 MSE: 0.0020758891478180885
Epoch 42 MSE: 0.0018987004877999425
Epoch 43 MSE: 0.0017068389570340514
Epoch 44 MSE: 0.001521158730611205
Epoch 45 MSE: 0.001373528502881527
Epoch 46 MSE: 0.0012973977718502283
Epoch 47 MSE: 0.0012996182776987553
Epoch 48 MSE: 0.0013485403032973409
Epoch 49 MSE: 0.0013998413924127817
Epoch 50 MSE: 0.0014293681597337127
Epoch 51 MSE: 0.0014305050717666745
Epoch 52 MSE: 0.0013945832615718246
Epoch 53 MSE: 0.0013175298226997256
Epoch 54 MSE: 0.0012180840130895376
Epoch 55 MSE: 0.0011275821598246694
Epoch 56 MSE: 0.0010627994779497385

Epoch 57 MSE: 0.0010221871780231595
 Epoch 58 MSE: 0.0010025978554040194
 Epoch 59 MSE: 0.0010020349873229861
 Epoch 60 MSE: 0.001009102095849812
 Epoch 61 MSE: 0.0010067271068692207
 Epoch 62 MSE: 0.0009878977434709668
 Epoch 63 MSE: 0.0009575225994922221
 Epoch 64 MSE: 0.0009201793582178652
 Epoch 65 MSE: 0.0008776998147368431
 Epoch 66 MSE: 0.0008374525932595134
 Epoch 67 MSE: 0.0008087988826446235
 Epoch 68 MSE: 0.0007916488102637231
 Epoch 69 MSE: 0.0007805172353982925
 Epoch 70 MSE: 0.0007740383734926581
 Epoch 71 MSE: 0.0007693621446378529
 Epoch 72 MSE: 0.0007592898327857256
 Epoch 73 MSE: 0.0007427686359733343
 Epoch 74 MSE: 0.0007236749515868723
 Epoch 75 MSE: 0.0007023606449365616
 Epoch 76 MSE: 0.0006807553581893444
 Epoch 77 MSE: 0.0006636265316046774
 Epoch 78 MSE: 0.0006507841171696782
 Epoch 79 MSE: 0.0006401201826520264
 Epoch 80 MSE: 0.0006318048108369112
 Epoch 81 MSE: 0.000623609172180295
 Epoch 82 MSE: 0.0006127976230345666
 Epoch 83 MSE: 0.0006002678419463336
 Epoch 84 MSE: 0.000586525711696595
 Epoch 85 MSE: 0.0005715891602449119
 Epoch 86 MSE: 0.0005577430129051208
 Epoch 87 MSE: 0.0005458130617626011
 Epoch 88 MSE: 0.0005351038416847587
 Epoch 89 MSE: 0.0005260297330096364
 Epoch 90 MSE: 0.000517552369274199
 Epoch 91 MSE: 0.0005083277937956154
 Epoch 92 MSE: 0.0004986839485354722
 Epoch 93 MSE: 0.0004882697539869696
 Epoch 94 MSE: 0.00047738742432557046
 Epoch 95 MSE: 0.0004671572532970458
 Epoch 96 MSE: 0.0004575165512505919
 Epoch 97 MSE: 0.00044874826562590897
 Epoch 98 MSE: 0.0004408386303111911
 Epoch 99 MSE: 0.00043299238313920796
 T-time: 6.1838698387146

=====
 Train Score: 0.62 RMSE
 =====

Validation Score: 13.35 RMSE

=====

=====

Time Step = 20 | Hidden States = 4 | Num Layers = 1

=====

Epoch	0	MSE:	0.0476691909134388
Epoch	1	MSE:	0.04031091183423996
Epoch	2	MSE:	0.0353727713227272
Epoch	3	MSE:	0.03228141367435455
Epoch	4	MSE:	0.030462227761745453
Epoch	5	MSE:	0.029329154640436172
Epoch	6	MSE:	0.028265638276934624
Epoch	7	MSE:	0.026802033185958862
Epoch	8	MSE:	0.02471897006034851
Epoch	9	MSE:	0.022013423964381218
Epoch	10	MSE:	0.018835794180631638
Epoch	11	MSE:	0.015446249395608902
Epoch	12	MSE:	0.0121819619089365
Epoch	13	MSE:	0.009398289024829865
Epoch	14	MSE:	0.007339555770158768
Epoch	15	MSE:	0.005936325062066317
Epoch	16	MSE:	0.00476225558668375
Epoch	17	MSE:	0.003475409699603915
Epoch	18	MSE:	0.0022553580347448587
Epoch	19	MSE:	0.0016735362587496638
Epoch	20	MSE:	0.0021435911767184734
Epoch	21	MSE:	0.0033493235241621733
Epoch	22	MSE:	0.004397901240736246
Epoch	23	MSE:	0.004697822965681553
Epoch	24	MSE:	0.004306400194764137
Epoch	25	MSE:	0.003626349149271846
Epoch	26	MSE:	0.0030288593843579292
Epoch	27	MSE:	0.002633433323353529
Epoch	28	MSE:	0.00232895789667964
Epoch	29	MSE:	0.001985090086236596
Epoch	30	MSE:	0.001604872290045023
Epoch	31	MSE:	0.001288596075028181
Epoch	32	MSE:	0.0011267525842413306
Epoch	33	MSE:	0.0011394666507840157
Epoch	34	MSE:	0.0012776257935911417
Epoch	35	MSE:	0.0014575390378013253
Epoch	36	MSE:	0.0016005780780687928
Epoch	37	MSE:	0.0016598358051851392
Epoch	38	MSE:	0.0016276946989819407
Epoch	39	MSE:	0.001527489977888763
Epoch	40	MSE:	0.0013966637197881937

Epoch 41 MSE: 0.0012691259616985917
Epoch 42 MSE: 0.0011630617082118988
Epoch 43 MSE: 0.0010781921446323395
Epoch 44 MSE: 0.001002966775558889
Epoch 45 MSE: 0.0009272439638152719
Epoch 46 MSE: 0.0008523438591510057
Epoch 47 MSE: 0.000791627389844507
Epoch 48 MSE: 0.0007611485198140144
Epoch 49 MSE: 0.0007670848281122744
Epoch 50 MSE: 0.0007990785525180399
Epoch 51 MSE: 0.0008344135712832212
Epoch 52 MSE: 0.0008502000127919018
Epoch 53 MSE: 0.0008352378499694169
Epoch 54 MSE: 0.0007940737414173782
Epoch 55 MSE: 0.0007417165907099843
Epoch 56 MSE: 0.000693676236551255
Epoch 57 MSE: 0.0006581316702067852
Epoch 58 MSE: 0.0006344766588881612
Epoch 59 MSE: 0.0006175278103910387
Epoch 60 MSE: 0.000603084044996649
Epoch 61 MSE: 0.0005906199221499264
Epoch 62 MSE: 0.0005820220103487372
Epoch 63 MSE: 0.0005783993401564658
Epoch 64 MSE: 0.0005779106286354363
Epoch 65 MSE: 0.000576186808757484
Epoch 66 MSE: 0.0005688189994543791
Epoch 67 MSE: 0.0005540263373404741
Epoch 68 MSE: 0.0005337024922482669
Epoch 69 MSE: 0.0005122337606735528
Epoch 70 MSE: 0.000493955856654793
Epoch 71 MSE: 0.0004809240344911814
Epoch 72 MSE: 0.00047235345118679106
Epoch 73 MSE: 0.00046587447286583483
Epoch 74 MSE: 0.0004594610654748976
Epoch 75 MSE: 0.0004525370604824275
Epoch 76 MSE: 0.00044560772948898375
Epoch 77 MSE: 0.0004390606773085892
Epoch 78 MSE: 0.0004323889734223485
Epoch 79 MSE: 0.0004245254385750741
Epoch 80 MSE: 0.00041487280395813286
Epoch 81 MSE: 0.00040401038131676614
Epoch 82 MSE: 0.00039342170930467546
Epoch 83 MSE: 0.00038448895793408155
Epoch 84 MSE: 0.0003776047669816762
Epoch 85 MSE: 0.000372076581697911
Epoch 86 MSE: 0.0003667909768410027
Epoch 87 MSE: 0.00036101051955483854
Epoch 88 MSE: 0.00035468567511998117

```

Epoch 89 MSE: 0.0003481664170976728
Epoch 90 MSE: 0.00034171357401646674
Epoch 91 MSE: 0.0003352834319230169
Epoch 92 MSE: 0.0003287134750280529
Epoch 93 MSE: 0.00032204369199462235
Epoch 94 MSE: 0.00031560685602016747
Epoch 95 MSE: 0.00030978964059613645
Epoch 96 MSE: 0.00030469545163214207
Epoch 97 MSE: 0.00030003764550201595
Epoch 98 MSE: 0.0002953621151391417
Epoch 99 MSE: 0.0002903850399889052
T-time: 4.63914680480957

```

```
=====
```

```
Train Score: 0.51 RMSE
```

```
=====
```

```
Validation Score: 10.26 RMSE
```

```
=====
```

```
=====
```

```
Time Step = 20 | Hidden States = 4 | Num Layers = 2
```

```
=====
```

```

Epoch 0 MSE: 0.3314470052719116
Epoch 1 MSE: 0.2895655930042267
Epoch 2 MSE: 0.25215527415275574
Epoch 3 MSE: 0.21890045702457428
Epoch 4 MSE: 0.18922480940818787
Epoch 5 MSE: 0.16251906752586365
Epoch 6 MSE: 0.13822953402996063
Epoch 7 MSE: 0.11594878882169724
Epoch 8 MSE: 0.09545944631099701
Epoch 9 MSE: 0.07677548378705978
Epoch 10 MSE: 0.06018766760826111
Epoch 11 MSE: 0.04628366976976395
Epoch 12 MSE: 0.03590754047036171
Epoch 13 MSE: 0.03000040538609028
Epoch 14 MSE: 0.029201937839388847
Epoch 15 MSE: 0.033059291541576385
Epoch 16 MSE: 0.03924023360013962
Epoch 17 MSE: 0.04450882598757744
Epoch 18 MSE: 0.046926554292440414
Epoch 19 MSE: 0.04635290056467056
Epoch 20 MSE: 0.043653108179569244
Epoch 21 MSE: 0.03995268791913986
Epoch 22 MSE: 0.03621889278292656
Epoch 23 MSE: 0.0330883227288723
Epoch 24 MSE: 0.030851956456899643

```

Epoch	25	MSE:	0.029529618099331856
Epoch	26	MSE:	0.02897460013628006
Epoch	27	MSE:	0.028967594727873802
Epoch	28	MSE:	0.029281869530677795
Epoch	29	MSE:	0.029719509184360504
Epoch	30	MSE:	0.03012651391327381
Epoch	31	MSE:	0.030395211651921272
Epoch	32	MSE:	0.030460434034466743
Epoch	33	MSE:	0.03029320389032364
Epoch	34	MSE:	0.02989385649561882
Epoch	35	MSE:	0.029285456985235214
Epoch	36	MSE:	0.02850763313472271
Epoch	37	MSE:	0.027610791847109795
Epoch	38	MSE:	0.02665044739842415
Epoch	39	MSE:	0.0256815105676651
Epoch	40	MSE:	0.02475237473845482
Epoch	41	MSE:	0.02389901503920555
Epoch	42	MSE:	0.023139510303735733
Epoch	43	MSE:	0.022470014169812202
Epoch	44	MSE:	0.0218634232878685
Epoch	45	MSE:	0.021272191777825356
Epoch	46	MSE:	0.020636167377233505
Epoch	47	MSE:	0.019894815981388092
Epoch	48	MSE:	0.019001543521881104
Epoch	49	MSE:	0.017935728654265404
Epoch	50	MSE:	0.01670856401324272
Epoch	51	MSE:	0.015360022895038128
Epoch	52	MSE:	0.013947776518762112
Epoch	53	MSE:	0.012531949207186699
Epoch	54	MSE:	0.011160898953676224
Epoch	55	MSE:	0.009862413629889488
Epoch	56	MSE:	0.008642690256237984
Epoch	57	MSE:	0.007492608856409788
Epoch	58	MSE:	0.006399011705070734
Epoch	59	MSE:	0.005357502028346062
Epoch	60	MSE:	0.0043825567699968815
Epoch	61	MSE:	0.0035107603762298822
Epoch	62	MSE:	0.00279443571344018
Epoch	63	MSE:	0.0022860649041831493
Epoch	64	MSE:	0.0020178291015326977
Epoch	65	MSE:	0.0019835960119962692
Epoch	66	MSE:	0.0021318658255040646
Epoch	67	MSE:	0.002376530086621642
Epoch	68	MSE:	0.0026245536282658577
Epoch	69	MSE:	0.002806229516863823
Epoch	70	MSE:	0.0028888678643852472
Epoch	71	MSE:	0.002869753632694483
Epoch	72	MSE:	0.0027614776045084

```
Epoch 73 MSE: 0.0025825551711022854
Epoch 74 MSE: 0.002354794181883335
Epoch 75 MSE: 0.002102434169501066
Epoch 76 MSE: 0.0018499356228858232
Epoch 77 MSE: 0.0016188282752409577
Epoch 78 MSE: 0.0014251484535634518
Epoch 79 MSE: 0.0012781880795955658
Epoch 80 MSE: 0.001180431921966374
Epoch 81 MSE: 0.0011283335043117404
Epoch 82 MSE: 0.0011136899702250957
Epoch 83 MSE: 0.0011254535056650639
Epoch 84 MSE: 0.0011517409002408385
Epoch 85 MSE: 0.0011816861806437373
Epoch 86 MSE: 0.0012067868374288082
Epoch 87 MSE: 0.0012215296737849712
Epoch 88 MSE: 0.001223295577801764
Epoch 89 MSE: 0.0012117772130295634
Epoch 90 MSE: 0.0011882188264280558
Epoch 91 MSE: 0.0011547630419954658
Epoch 92 MSE: 0.0011140452697873116
Epoch 93 MSE: 0.001068995683453977
Epoch 94 MSE: 0.001022734446451068
Epoch 95 MSE: 0.0009783946443349123
Epoch 96 MSE: 0.0009388247271999717
Epoch 97 MSE: 0.0009061988675966859
Epoch 98 MSE: 0.0008816739427857101
Epoch 99 MSE: 0.0008652282995171845
T-time: 8.572082757949829
```

```
=====
Train Score: 0.88 RMSE
=====
Validation Score: 15.17 RMSE
=====
```

```
=====
Time Step = 20 | Hidden States = 8 | Num Layers = 1
=====
```

```
Epoch 0 MSE: 0.05825553834438324
Epoch 1 MSE: 0.043158553540706635
Epoch 2 MSE: 0.03295919671654701
Epoch 3 MSE: 0.027600597590208054
Epoch 4 MSE: 0.026622261852025986
Epoch 5 MSE: 0.028469804674386978
Epoch 6 MSE: 0.030398914590477943
Epoch 7 MSE: 0.030631273984909058
Epoch 8 MSE: 0.029163261875510216
```

Epoch 9 MSE: 0.026775440201163292
Epoch 10 MSE: 0.024265071377158165
Epoch 11 MSE: 0.022158166393637657
Epoch 12 MSE: 0.020665429532527924
Epoch 13 MSE: 0.019741494208574295
Epoch 14 MSE: 0.019177567213773727
Epoch 15 MSE: 0.018694598227739334
Epoch 16 MSE: 0.018022865056991577
Epoch 17 MSE: 0.016962334513664246
Epoch 18 MSE: 0.015420733019709587
Epoch 19 MSE: 0.01342847291380167
Epoch 20 MSE: 0.0111320149153471
Epoch 21 MSE: 0.00876751821488142
Epoch 22 MSE: 0.006611123215407133
Epoch 23 MSE: 0.004893188830465078
Epoch 24 MSE: 0.0036720118951052427
Epoch 25 MSE: 0.0027532484382390976
Epoch 26 MSE: 0.0018820111872628331
Epoch 27 MSE: 0.0011631317902356386
Epoch 28 MSE: 0.0010896854801103473
Epoch 29 MSE: 0.0019411685643717647
Epoch 30 MSE: 0.0031294170767068863
Epoch 31 MSE: 0.0036110426299273968
Epoch 32 MSE: 0.003002812620252371
Epoch 33 MSE: 0.0017706271028146148
Epoch 34 MSE: 0.0006660091457888484
Epoch 35 MSE: 0.00019253331993240863
Epoch 36 MSE: 0.0003538781020324677
Epoch 37 MSE: 0.0007639992400072515
Epoch 38 MSE: 0.001027119462378323
Epoch 39 MSE: 0.0010249929036945105
Epoch 40 MSE: 0.0008845517295412719
Epoch 41 MSE: 0.0007781816530041397
Epoch 42 MSE: 0.0007803333573974669
Epoch 43 MSE: 0.0008475292706862092
Epoch 44 MSE: 0.0008790342835709453
Epoch 45 MSE: 0.0007954585016705096
Epoch 46 MSE: 0.0005910788895562291
Epoch 47 MSE: 0.00033970436197705567
Epoch 48 MSE: 0.000153801724081859
Epoch 49 MSE: 0.0001139388041337952
Epoch 50 MSE: 0.00020751552074216306
Epoch 51 MSE: 0.0003314586647320539
Epoch 52 MSE: 0.00037845526821911335
Epoch 53 MSE: 0.0003311529872007668
Epoch 54 MSE: 0.0002591580559965223
Epoch 55 MSE: 0.00023045105626806617
Epoch 56 MSE: 0.0002466205332893878

Epoch 57 MSE: 0.00025977694895118475
Epoch 58 MSE: 0.00023122831771615893
Epoch 59 MSE: 0.0001673258957453072
Epoch 60 MSE: 0.0001086046831915155
Epoch 61 MSE: 9.194685844704509e-05
Epoch 62 MSE: 0.00012041290756314993
Epoch 63 MSE: 0.00016374020196963102
Epoch 64 MSE: 0.00018601964984554797
Epoch 65 MSE: 0.00017436363850720227
Epoch 66 MSE: 0.0001439887419110164
Epoch 67 MSE: 0.00011951993656111881
Epoch 68 MSE: 0.00011309246474411339
Epoch 69 MSE: 0.00011793054727604613
Epoch 70 MSE: 0.00011904719576705247
Epoch 71 MSE: 0.00010867404489545152
Epoch 72 MSE: 9.274765034206212e-05
Epoch 73 MSE: 8.406941924476996e-05
Epoch 74 MSE: 8.930880721891299e-05
Epoch 75 MSE: 0.0001023005970637314
Epoch 76 MSE: 0.00011016665666829795
Epoch 77 MSE: 0.00010580290836514905
Epoch 78 MSE: 9.362892888020724e-05
Epoch 79 MSE: 8.355755562661216e-05
Epoch 80 MSE: 8.105902088573202e-05
Epoch 81 MSE: 8.362023800145835e-05
Epoch 82 MSE: 8.532070205546916e-05
Epoch 83 MSE: 8.324914961121976e-05
Epoch 84 MSE: 7.947967969812453e-05
Epoch 85 MSE: 7.785147317918018e-05
Epoch 86 MSE: 7.961165101733059e-05
Epoch 87 MSE: 8.228226215578616e-05
Epoch 88 MSE: 8.243647607741877e-05
Epoch 89 MSE: 7.91824422776699e-05
Epoch 90 MSE: 7.480111526092514e-05
Epoch 91 MSE: 7.224494765978307e-05
Epoch 92 MSE: 7.237038516905159e-05
Epoch 93 MSE: 7.360773452091962e-05
Epoch 94 MSE: 7.395144348265603e-05
Epoch 95 MSE: 7.292721420526505e-05
Epoch 96 MSE: 7.16338909114711e-05
Epoch 97 MSE: 7.118537905625999e-05
Epoch 98 MSE: 7.14432098902762e-05
Epoch 99 MSE: 7.134530460461974e-05
T-time: 4.921580076217651

=====
Train Score: 0.25 RMSE
=====

Validation Score: 5.86 RMSE

=====

=====

Time Step = 20 | Hidden States = 8 | Num Layers = 2

=====

Epoch	0	MSE:	0.12994571030139923
Epoch	1	MSE:	0.0994478389620781
Epoch	2	MSE:	0.07569443434476852
Epoch	3	MSE:	0.05788685753941536
Epoch	4	MSE:	0.045414961874485016
Epoch	5	MSE:	0.037923723459243774
Epoch	6	MSE:	0.03514662757515907
Epoch	7	MSE:	0.03640522062778473
Epoch	8	MSE:	0.039832279086112976
Epoch	9	MSE:	0.042751289904117584
Epoch	10	MSE:	0.04362796992063522
Epoch	11	MSE:	0.04252170771360397
Epoch	12	MSE:	0.04023510217666626
Epoch	13	MSE:	0.037635479122400284
Epoch	14	MSE:	0.0353538952767849
Epoch	15	MSE:	0.03371354937553406
Epoch	16	MSE:	0.03277355432510376
Epoch	17	MSE:	0.03241555765271187
Epoch	18	MSE:	0.032428279519081116
Epoch	19	MSE:	0.03256998956203461
Epoch	20	MSE:	0.032610125839710236
Epoch	21	MSE:	0.03235846012830734
Epoch	22	MSE:	0.031681936234235764
Epoch	23	MSE:	0.030505232512950897
Epoch	24	MSE:	0.028799353167414665
Epoch	25	MSE:	0.026572324335575104
Epoch	26	MSE:	0.02388254553079605
Epoch	27	MSE:	0.02088451012969017
Epoch	28	MSE:	0.017876796424388885
Epoch	29	MSE:	0.015182023867964745
Epoch	30	MSE:	0.01264833565801382
Epoch	31	MSE:	0.009577754884958267
Epoch	32	MSE:	0.0059660738334059715
Epoch	33	MSE:	0.003719171741977334
Epoch	34	MSE:	0.004525795578956604
Epoch	35	MSE:	0.006471995264291763
Epoch	36	MSE:	0.00730649009346962
Epoch	37	MSE:	0.006957707926630974
Epoch	38	MSE:	0.006032193079590797
Epoch	39	MSE:	0.00510413758456707
Epoch	40	MSE:	0.004479322582483292

Epoch	41	MSE:	0.004130595829337835
Epoch	42	MSE:	0.0038935192860662937
Epoch	43	MSE:	0.0036046309396624565
Epoch	44	MSE:	0.0031888887751847506
Epoch	45	MSE:	0.002893792698159814
Epoch	46	MSE:	0.0029255289118736982
Epoch	47	MSE:	0.0032006404362618923
Epoch	48	MSE:	0.0035050734877586365
Epoch	49	MSE:	0.0036383706610649824
Epoch	50	MSE:	0.0035148663446307182
Epoch	51	MSE:	0.0031801918521523476
Epoch	52	MSE:	0.0027622508350759745
Epoch	53	MSE:	0.0024011079221963882
Epoch	54	MSE:	0.002186909317970276
Epoch	55	MSE:	0.0021251945290714502
Epoch	56	MSE:	0.002145368605852127
Epoch	57	MSE:	0.002153625711798668
Epoch	58	MSE:	0.0020956448279321194
Epoch	59	MSE:	0.001979268854483962
Epoch	60	MSE:	0.0018479942809790373
Epoch	61	MSE:	0.0017374414019286633
Epoch	62	MSE:	0.0016504242084920406
Epoch	63	MSE:	0.0015643162187188864
Epoch	64	MSE:	0.001458246260881424
Epoch	65	MSE:	0.0013357948046177626
Epoch	66	MSE:	0.0012255286565050483
Epoch	67	MSE:	0.001158796134404838
Epoch	68	MSE:	0.00114130147267133
Epoch	69	MSE:	0.0011423772666603327
Epoch	70	MSE:	0.0011155246756970882
Epoch	71	MSE:	0.001036631758324802
Epoch	72	MSE:	0.0009249103022739291
Epoch	73	MSE:	0.0008253629202954471
Epoch	74	MSE:	0.000770055630709976
Epoch	75	MSE:	0.0007545240805484354
Epoch	76	MSE:	0.0007474928861483932
Epoch	77	MSE:	0.0007205851725302637
Epoch	78	MSE:	0.0006701528327539563
Epoch	79	MSE:	0.0006143125356175005
Epoch	80	MSE:	0.0005714285071007907
Epoch	81	MSE:	0.0005423253169283271
Epoch	82	MSE:	0.0005139620043337345
Epoch	83	MSE:	0.0004785172059200704
Epoch	84	MSE:	0.0004433322756085545
Epoch	85	MSE:	0.0004196815425530076
Epoch	86	MSE:	0.0004065359244123101
Epoch	87	MSE:	0.0003905880148522556
Epoch	88	MSE:	0.00036180380266159773

Epoch 89 MSE: 0.0003253490722272545
Epoch 90 MSE: 0.0002959334524348378
Epoch 91 MSE: 0.00028098520124331117
Epoch 92 MSE: 0.00027260713977739215
Epoch 93 MSE: 0.00025842615286819637
Epoch 94 MSE: 0.00023676789714954793
Epoch 95 MSE: 0.00021586731600109488
Epoch 96 MSE: 0.0002007576695177704
Epoch 97 MSE: 0.0001880618219729513
Epoch 98 MSE: 0.00017398047202732414
Epoch 99 MSE: 0.00016078643966466188
T-time: 8.467175245285034

=====

Train Score: 0.38 RMSE

=====

Validation Score: 12.32 RMSE

=====

=====

Time Step = 20 | Hidden States = 16 | Num Layers = 1

=====

Epoch 0 MSE: 0.03276994824409485
Epoch 1 MSE: 0.030665095895528793
Epoch 2 MSE: 0.02820461057126522
Epoch 3 MSE: 0.025931522250175476
Epoch 4 MSE: 0.02304583042860031
Epoch 5 MSE: 0.020216332748532295
Epoch 6 MSE: 0.016421645879745483
Epoch 7 MSE: 0.011813461780548096
Epoch 8 MSE: 0.006941511295735836
Epoch 9 MSE: 0.0017938256496563554
Epoch 10 MSE: 0.0009985202923417091
Epoch 11 MSE: 0.008369500748813152
Epoch 12 MSE: 0.006530001759529114
Epoch 13 MSE: 0.003844093531370163
Epoch 14 MSE: 0.0005515284719876945
Epoch 15 MSE: 0.0007174302591010928
Epoch 16 MSE: 0.0011479513486847281
Epoch 17 MSE: 0.001312021166086197
Epoch 18 MSE: 0.0019177976064383984
Epoch 19 MSE: 0.0025622029788792133
Epoch 20 MSE: 0.0026190553326159716
Epoch 21 MSE: 0.0022416606079787016
Epoch 22 MSE: 0.0018987029325217009
Epoch 23 MSE: 0.0016421128530055285
Epoch 24 MSE: 0.001196470926515758

Epoch	25	MSE:	0.0005822759703733027
Epoch	26	MSE:	0.00021332601318135858
Epoch	27	MSE:	0.00023780783521942794
Epoch	28	MSE:	0.00031020137248560786
Epoch	29	MSE:	0.0003875640977639705
Epoch	30	MSE:	0.0006926088244654238
Epoch	31	MSE:	0.0008866877760738134
Epoch	32	MSE:	0.0007205175934359431
Epoch	33	MSE:	0.000524865579791367
Epoch	34	MSE:	0.00038882874650880694
Epoch	35	MSE:	0.00018657397595234215
Epoch	36	MSE:	6.500500603578985e-05
Epoch	37	MSE:	0.00011949735198868439
Epoch	38	MSE:	0.00020634061365853995
Epoch	39	MSE:	0.00024057121481746435
Epoch	40	MSE:	0.00027965556364506483
Epoch	41	MSE:	0.0003317320079077035
Epoch	42	MSE:	0.00032263522734865546
Epoch	43	MSE:	0.00024628863320685923
Epoch	44	MSE:	0.000177295645698905
Epoch	45	MSE:	0.00013757936540059745
Epoch	46	MSE:	9.087140642805025e-05
Epoch	47	MSE:	5.373802196118049e-05
Epoch	48	MSE:	7.144011033233255e-05
Epoch	49	MSE:	0.00011273685231572017
Epoch	50	MSE:	0.00012818754476029426
Epoch	51	MSE:	0.00013610247697215527
Epoch	52	MSE:	0.0001434089062968269
Epoch	53	MSE:	0.00011993023508694023
Epoch	54	MSE:	8.16081155790016e-05
Epoch	55	MSE:	6.394574302248657e-05
Epoch	56	MSE:	5.7671753893373534e-05
Epoch	57	MSE:	5.1428854931145906e-05
Epoch	58	MSE:	5.885305654373951e-05
Epoch	59	MSE:	7.571359310531989e-05
Epoch	60	MSE:	8.178706048056483e-05
Epoch	61	MSE:	7.82418719609268e-05
Epoch	62	MSE:	7.538565114373341e-05
Epoch	63	MSE:	6.807868339819834e-05
Epoch	64	MSE:	5.4416606872109696e-05
Epoch	65	MSE:	4.659507976612076e-05
Epoch	66	MSE:	4.7115310735534877e-05
Epoch	67	MSE:	4.790042294189334e-05
Epoch	68	MSE:	5.035730646341108e-05
Epoch	69	MSE:	5.636470450554043e-05
Epoch	70	MSE:	5.80581727263052e-05
Epoch	71	MSE:	5.429987868410535e-05
Epoch	72	MSE:	5.114873420097865e-05

```

Epoch 73 MSE: 4.7759374865563586e-05
Epoch 74 MSE: 4.338206417742185e-05
Epoch 75 MSE: 4.250931669957936e-05
Epoch 76 MSE: 4.453271321835928e-05
Epoch 77 MSE: 4.562840695143677e-05
Epoch 78 MSE: 4.6628811105620116e-05
Epoch 79 MSE: 4.779420851264149e-05
Epoch 80 MSE: 4.670589987654239e-05
Epoch 81 MSE: 4.439886470208876e-05
Epoch 82 MSE: 4.3125528463860974e-05
Epoch 83 MSE: 4.206654193694703e-05
Epoch 84 MSE: 4.127145803067833e-05
Epoch 85 MSE: 4.199579052510671e-05
Epoch 86 MSE: 4.295536928111687e-05
Epoch 87 MSE: 4.304940011934377e-05
Epoch 88 MSE: 4.3082221964141354e-05
Epoch 89 MSE: 4.2715604649856687e-05
Epoch 90 MSE: 4.160636672168039e-05
Epoch 91 MSE: 4.090703441761434e-05
Epoch 92 MSE: 4.074715980095789e-05
Epoch 93 MSE: 4.059166167280637e-05
Epoch 94 MSE: 4.081426959601231e-05
Epoch 95 MSE: 4.12047520512715e-05
Epoch 96 MSE: 4.1120409150607884e-05
Epoch 97 MSE: 4.086610351805575e-05
Epoch 98 MSE: 4.061046274728142e-05
Epoch 99 MSE: 4.0142993384506553e-05
T-time: 12.791428804397583

```

```

=====
Train Score: 0.19 RMSE
=====
Validation Score: 5.12 RMSE
=====

```

```

=====
Time Step = 20 | Hidden States = 16 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.055617596954107285
Epoch 1 MSE: 0.040461476892232895
Epoch 2 MSE: 0.03614800050854683
Epoch 3 MSE: 0.03908803313970566
Epoch 4 MSE: 0.03798329457640648
Epoch 5 MSE: 0.03556669503450394
Epoch 6 MSE: 0.03417842090129852
Epoch 7 MSE: 0.03373211994767189
Epoch 8 MSE: 0.033635273575782776

```

Epoch 9 MSE: 0.03343185409903526
Epoch 10 MSE: 0.03285475820302963
Epoch 11 MSE: 0.03176776319742203
Epoch 12 MSE: 0.030107436701655388
Epoch 13 MSE: 0.027857108041644096
Epoch 14 MSE: 0.025073327124118805
Epoch 15 MSE: 0.021848665550351143
Epoch 16 MSE: 0.01788274012506008
Epoch 17 MSE: 0.012161249294877052
Epoch 18 MSE: 0.005137161817401648
Epoch 19 MSE: 0.0012971122050657868
Epoch 20 MSE: 0.004584522917866707
Epoch 21 MSE: 0.008680528029799461
Epoch 22 MSE: 0.008846175856888294
Epoch 23 MSE: 0.006379065569490194
Epoch 24 MSE: 0.0034846095368266106
Epoch 25 MSE: 0.0016557638300582767
Epoch 26 MSE: 0.001415078528225422
Epoch 27 MSE: 0.0022226660512387753
Epoch 28 MSE: 0.003062036819756031
Epoch 29 MSE: 0.003463856177404523
Epoch 30 MSE: 0.00352539517916739
Epoch 31 MSE: 0.0032754039857536554
Epoch 32 MSE: 0.002669117646291852
Epoch 33 MSE: 0.001893228036351502
Epoch 34 MSE: 0.001357685076072812
Epoch 35 MSE: 0.00130429957062006
Epoch 36 MSE: 0.0014579185517504811
Epoch 37 MSE: 0.001524752820841968
Epoch 38 MSE: 0.0016521288780495524
Epoch 39 MSE: 0.0018523557810112834
Epoch 40 MSE: 0.001813726150430739
Epoch 41 MSE: 0.0014741899212822318
Epoch 42 MSE: 0.0011370973661541939
Epoch 43 MSE: 0.0009572810959070921
Epoch 44 MSE: 0.0008054820937104523
Epoch 45 MSE: 0.0007004032959230244
Epoch 46 MSE: 0.0007721668807789683
Epoch 47 MSE: 0.0009131281985901296
Epoch 48 MSE: 0.0009244944085367024
Epoch 49 MSE: 0.0008081443957053125
Epoch 50 MSE: 0.0006669650902040303
Epoch 51 MSE: 0.0005049013998359442
Epoch 52 MSE: 0.0003425285394769162
Epoch 53 MSE: 0.000297767692245543
Epoch 54 MSE: 0.00034978706389665604
Epoch 55 MSE: 0.0003694285114761442
Epoch 56 MSE: 0.00034754324587993324

Epoch 57 MSE: 0.0002812344755511731
Epoch 58 MSE: 0.00015871231153141707
Epoch 59 MSE: 0.00010163098340854049
Epoch 60 MSE: 0.00012164582585683092
Epoch 61 MSE: 0.00017082707199733704
Epoch 62 MSE: 0.00020692349062301219
Epoch 63 MSE: 0.00015023062587715685
Epoch 64 MSE: 8.737985626794398e-05
Epoch 65 MSE: 7.144839037209749e-05
Epoch 66 MSE: 0.00010701202700147405
Epoch 67 MSE: 0.00014858583745080978
Epoch 68 MSE: 0.00013561882951762527
Epoch 69 MSE: 0.00010310432116966695
Epoch 70 MSE: 6.959307938814163e-05
Epoch 71 MSE: 8.790752326603979e-05
Epoch 72 MSE: 0.00010773472604341805
Epoch 73 MSE: 0.00011232728138566017
Epoch 74 MSE: 8.515261288266629e-05
Epoch 75 MSE: 6.445386679843068e-05
Epoch 76 MSE: 6.880739965708926e-05
Epoch 77 MSE: 7.931187428766862e-05
Epoch 78 MSE: 8.44935784698464e-05
Epoch 79 MSE: 6.823447620263323e-05
Epoch 80 MSE: 5.777169280918315e-05
Epoch 81 MSE: 5.4394429753301665e-05
Epoch 82 MSE: 6.334391218842939e-05
Epoch 83 MSE: 6.72365931677632e-05
Epoch 84 MSE: 6.0493959608720616e-05
Epoch 85 MSE: 5.339373092283495e-05
Epoch 86 MSE: 5.0261642172699794e-05
Epoch 87 MSE: 5.584623431786895e-05
Epoch 88 MSE: 5.830606824019924e-05
Epoch 89 MSE: 5.637291178572923e-05
Epoch 90 MSE: 5.141127621755004e-05
Epoch 91 MSE: 4.900311250821687e-05
Epoch 92 MSE: 5.1650276873260736e-05
Epoch 93 MSE: 5.3452800784725696e-05
Epoch 94 MSE: 5.2950839744880795e-05
Epoch 95 MSE: 4.936274854117073e-05
Epoch 96 MSE: 4.78304318676237e-05
Epoch 97 MSE: 4.870588963967748e-05
Epoch 98 MSE: 4.99523121106904e-05
Epoch 99 MSE: 4.9463280447525904e-05
T-time: 17.17224931716919

=====
Train Score: 0.21 RMSE
=====

Validation Score: 6.12 RMSE

=====

=====

Time Step = 20 | Hidden States = 32 | Num Layers = 1

=====

Epoch	0	MSE:	0.054647479206323624
Epoch	1	MSE:	0.03648120164871216
Epoch	2	MSE:	0.032304421067237854
Epoch	3	MSE:	0.03474355861544609
Epoch	4	MSE:	0.03280533477663994
Epoch	5	MSE:	0.028274912387132645
Epoch	6	MSE:	0.02457757294178009
Epoch	7	MSE:	0.022285714745521545
Epoch	8	MSE:	0.02035769447684288
Epoch	9	MSE:	0.017211314290761948
Epoch	10	MSE:	0.011273961514234543
Epoch	11	MSE:	0.0032086812425404787
Epoch	12	MSE:	0.01175837591290474
Epoch	13	MSE:	0.003141402965411544
Epoch	14	MSE:	0.0015027684858068824
Epoch	15	MSE:	0.005173086654394865
Epoch	16	MSE:	0.006386267952620983
Epoch	17	MSE:	0.0044372957199811935
Epoch	18	MSE:	0.0014774819137528539
Epoch	19	MSE:	0.00033436642843298614
Epoch	20	MSE:	0.002040162682533264
Epoch	21	MSE:	0.0034192902967333794
Epoch	22	MSE:	0.002188729587942362
Epoch	23	MSE:	0.0006446552579291165
Epoch	24	MSE:	0.0004921055515296757
Epoch	25	MSE:	0.0012262987438589334
Epoch	26	MSE:	0.0018178564496338367
Epoch	27	MSE:	0.0017250403761863708
Epoch	28	MSE:	0.0010487979743629694
Epoch	29	MSE:	0.0003498228034004569
Epoch	30	MSE:	0.00022648346202913672
Epoch	31	MSE:	0.0007135641644708812
Epoch	32	MSE:	0.0011146441102027893
Epoch	33	MSE:	0.0008929803152568638
Epoch	34	MSE:	0.00039733698940835893
Epoch	35	MSE:	0.00020610468345694244
Epoch	36	MSE:	0.0003865587350446731
Epoch	37	MSE:	0.0006218919297680259
Epoch	38	MSE:	0.000648828805424273
Epoch	39	MSE:	0.0004640010301955044
Epoch	40	MSE:	0.00025815394474193454

Epoch	41	MSE:	0.00021735051996074617
Epoch	42	MSE:	0.00034306812449358404
Epoch	43	MSE:	0.0004533316823653877
Epoch	44	MSE:	0.0004004799702670425
Epoch	45	MSE:	0.00024673412553966045
Epoch	46	MSE:	0.00016018908354453743
Epoch	47	MSE:	0.0002037107915384695
Epoch	48	MSE:	0.0002918366517405957
Epoch	49	MSE:	0.0003127134405076504
Epoch	50	MSE:	0.00024566028150729835
Epoch	51	MSE:	0.00016535223403479904
Epoch	52	MSE:	0.0001497129414929077
Epoch	53	MSE:	0.0001934567844728008
Epoch	54	MSE:	0.00022388208890333772
Epoch	55	MSE:	0.00019788571808021516
Epoch	56	MSE:	0.00014941080007702112
Epoch	57	MSE:	0.00013261126878205687
Epoch	58	MSE:	0.00015394826186820865
Epoch	59	MSE:	0.00017575659148860723
Epoch	60	MSE:	0.00016693015641067177
Epoch	61	MSE:	0.0001358155277557671
Epoch	62	MSE:	0.0001156265425379388
Epoch	63	MSE:	0.00012355137732811272
Epoch	64	MSE:	0.00014131284842733294
Epoch	65	MSE:	0.00014129254850558937
Epoch	66	MSE:	0.00012279611837584525
Epoch	67	MSE:	0.00010846887016668916
Epoch	68	MSE:	0.00011115415691165254
Epoch	69	MSE:	0.00012020060239592567
Epoch	70	MSE:	0.00011973019718425348
Epoch	71	MSE:	0.0001090204605134204
Epoch	72	MSE:	0.00010052078869193792
Epoch	73	MSE:	0.000102076111943461
Epoch	74	MSE:	0.00010737152479123324
Epoch	75	MSE:	0.00010602917609503493
Epoch	76	MSE:	9.805918671190739e-05
Epoch	77	MSE:	9.240830695489421e-05
Epoch	78	MSE:	9.364397556055337e-05
Epoch	79	MSE:	9.666867845226079e-05
Epoch	80	MSE:	9.50694375205785e-05
Epoch	81	MSE:	8.971377246780321e-05
Epoch	82	MSE:	8.633673860458657e-05
Epoch	83	MSE:	8.70184157975018e-05
Epoch	84	MSE:	8.794452151050791e-05
Epoch	85	MSE:	8.573003287892789e-05
Epoch	86	MSE:	8.213185355998576e-05
Epoch	87	MSE:	8.064151916187257e-05
Epoch	88	MSE:	8.121036080410704e-05

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Epoch 89 MSE: 8.091860945569351e-05
Epoch 90 MSE: 7.856896263547242e-05
Epoch 91 MSE: 7.611598266521469e-05
Epoch 92 MSE: 7.541648665210232e-05
Epoch 93 MSE: 7.557746721431613e-05
Epoch 94 MSE: 7.467650721082464e-05
Epoch 95 MSE: 7.273762457771227e-05
Epoch 96 MSE: 7.133638428058475e-05
Epoch 97 MSE: 7.097133493516594e-05
Epoch 98 MSE: 7.053482113406062e-05
Epoch 99 MSE: 6.928383663762361e-05
T-time: 19.999114751815796

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```

=====
Train Score: 0.25 RMSE
=====
Validation Score: 6.06 RMSE
=====

```

```

=====
Time Step = 20 | Hidden States = 32 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.040618978440761566
Epoch 1 MSE: 0.04281147941946983
Epoch 2 MSE: 0.036195024847984314
Epoch 3 MSE: 0.03292616829276085
Epoch 4 MSE: 0.032557085156440735
Epoch 5 MSE: 0.030960144475102425
Epoch 6 MSE: 0.026295436546206474
Epoch 7 MSE: 0.019574686884880066
Epoch 8 MSE: 0.014389541931450367
Epoch 9 MSE: 0.007475757040083408
Epoch 10 MSE: 0.0008210205123759806
Epoch 11 MSE: 0.010090870782732964
Epoch 12 MSE: 0.0070607322268188
Epoch 13 MSE: 0.0018260730430483818
Epoch 14 MSE: 0.0007192532648332417
Epoch 15 MSE: 0.001957071479409933
Epoch 16 MSE: 0.0034813072998076677
Epoch 17 MSE: 0.0039337510243058205
Epoch 18 MSE: 0.0032134391367435455
Epoch 19 MSE: 0.0019866065122187138
Epoch 20 MSE: 0.0012014649109914899
Epoch 21 MSE: 0.0009045402985066175
Epoch 22 MSE: 0.000983517151325941
Epoch 23 MSE: 0.0015868934569880366
Epoch 24 MSE: 0.00186759268399328

```


Epoch	25	MSE:	0.0017075836658477783
Epoch	26	MSE:	0.0013904622755944729
Epoch	27	MSE:	0.0008669569506309927
Epoch	28	MSE:	0.0005355679895728827
Epoch	29	MSE:	0.0005577965057455003
Epoch	30	MSE:	0.0007416111184284091
Epoch	31	MSE:	0.000952484377194196
Epoch	32	MSE:	0.0010651820339262486
Epoch	33	MSE:	0.000964015256613493
Epoch	34	MSE:	0.0007188546005636454
Epoch	35	MSE:	0.000508075871039182
Epoch	36	MSE:	0.0004137598443776369
Epoch	37	MSE:	0.0004381434991955757
Epoch	38	MSE:	0.00054739456390962
Epoch	39	MSE:	0.0006173465517349541
Epoch	40	MSE:	0.0005628871149383485
Epoch	41	MSE:	0.00044543895637616515
Epoch	42	MSE:	0.00032515102066099644
Epoch	43	MSE:	0.0002531992504373193
Epoch	44	MSE:	0.0002722999488469213
Epoch	45	MSE:	0.0003296692157164216
Epoch	46	MSE:	0.00035123637644574046
Epoch	47	MSE:	0.00033084998722188175
Epoch	48	MSE:	0.00027451166533865035
Epoch	49	MSE:	0.00020464873523451388
Epoch	50	MSE:	0.00017633654351811856
Epoch	51	MSE:	0.0001937545748660341
Epoch	52	MSE:	0.00021363218547776341
Epoch	53	MSE:	0.00022324759629555047
Epoch	54	MSE:	0.00020291823602747172
Epoch	55	MSE:	0.00015792869089636952
Epoch	56	MSE:	0.00013213518832344562
Epoch	57	MSE:	0.00013046184903942049
Epoch	58	MSE:	0.00013931546709500253
Epoch	59	MSE:	0.00015011505456641316
Epoch	60	MSE:	0.00014165484753903002
Epoch	61	MSE:	0.00011667511716950685
Epoch	62	MSE:	9.995536674978212e-05
Epoch	63	MSE:	9.635627793613821e-05
Epoch	64	MSE:	0.00010215606016572565
Epoch	65	MSE:	0.00010930553253274411
Epoch	66	MSE:	0.0001021002244669944
Epoch	67	MSE:	8.75506448210217e-05
Epoch	68	MSE:	7.922462100395933e-05
Epoch	69	MSE:	7.783198816468939e-05
Epoch	70	MSE:	8.237096335506067e-05
Epoch	71	MSE:	8.350572170456871e-05
Epoch	72	MSE:	7.578958320664242e-05

```

Epoch 73 MSE: 6.776477675884962e-05
Epoch 74 MSE: 6.405951717169955e-05
Epoch 75 MSE: 6.484367622761056e-05
Epoch 76 MSE: 6.721611134707928e-05
Epoch 77 MSE: 6.424181628972292e-05
Epoch 78 MSE: 5.865002458449453e-05
Epoch 79 MSE: 5.511551717063412e-05
Epoch 80 MSE: 5.4543936130357906e-05
Epoch 81 MSE: 5.61417436983902e-05
Epoch 82 MSE: 5.509438778972253e-05
Epoch 83 MSE: 5.172540477360599e-05
Epoch 84 MSE: 4.908813934889622e-05
Epoch 85 MSE: 4.818529851036146e-05
Epoch 86 MSE: 4.9039434088626876e-05
Epoch 87 MSE: 4.837533560930751e-05
Epoch 88 MSE: 4.616101068677381e-05
Epoch 89 MSE: 4.4178199459565803e-05
Epoch 90 MSE: 4.345014167483896e-05
Epoch 91 MSE: 4.385017746244557e-05
Epoch 92 MSE: 4.3200554500799626e-05
Epoch 93 MSE: 4.1761846659937873e-05
Epoch 94 MSE: 4.043874650960788e-05
Epoch 95 MSE: 4.012057252111845e-05
Epoch 96 MSE: 4.0292685298481956e-05
Epoch 97 MSE: 3.9715570892440155e-05
Epoch 98 MSE: 3.875664697261527e-05
Epoch 99 MSE: 3.797909812419675e-05
T-time: 38.14018797874451

```

```

=====
Train Score: 0.18 RMSE
=====
Validation Score: 3.35 RMSE
=====

```

```

=====
Time Step = 30 | Hidden States = 2 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.0931047797203064
Epoch 1 MSE: 0.08502224832773209
Epoch 2 MSE: 0.07804983854293823
Epoch 3 MSE: 0.07203090190887451
Epoch 4 MSE: 0.06682506948709488
Epoch 5 MSE: 0.06231138855218887
Epoch 6 MSE: 0.05838865041732788
Epoch 7 MSE: 0.05497321859002113
Epoch 8 MSE: 0.05199643224477768

```

Epoch 9 MSE: 0.04940212145447731
Epoch 10 MSE: 0.04714424908161163
Epoch 11 MSE: 0.045184843242168427
Epoch 12 MSE: 0.043492164462804794
Epoch 13 MSE: 0.04203920066356659
Epoch 14 MSE: 0.040802448987960815
Epoch 15 MSE: 0.039760932326316833
Epoch 16 MSE: 0.03889548406004906
Epoch 17 MSE: 0.038188185542821884
Epoch 18 MSE: 0.03762201964855194
Epoch 19 MSE: 0.037180621176958084
Epoch 20 MSE: 0.03684817627072334
Epoch 21 MSE: 0.03660937771201134
Epoch 22 MSE: 0.03644951805472374
Epoch 23 MSE: 0.03635454922914505
Epoch 24 MSE: 0.036311253905296326
Epoch 25 MSE: 0.03630734980106354
Epoch 26 MSE: 0.036331672221422195
Epoch 27 MSE: 0.036374274641275406
Epoch 28 MSE: 0.03642651438713074
Epoch 29 MSE: 0.036481112241744995
Epoch 30 MSE: 0.036532171070575714
Epoch 31 MSE: 0.03657514229416847
Epoch 32 MSE: 0.03660673648118973
Epoch 33 MSE: 0.03662484139204025
Epoch 34 MSE: 0.03662838041782379
Epoch 35 MSE: 0.03661717474460602
Epoch 36 MSE: 0.03659175708889961
Epoch 37 MSE: 0.036553237587213516
Epoch 38 MSE: 0.03650311008095741
Epoch 39 MSE: 0.036443136632442474
Epoch 40 MSE: 0.03637517988681793
Epoch 41 MSE: 0.03630111366510391
Epoch 42 MSE: 0.03622270002961159
Epoch 43 MSE: 0.03614149987697601
Epoch 44 MSE: 0.036058858036994934
Epoch 45 MSE: 0.03597583621740341
Epoch 46 MSE: 0.035893164575099945
Epoch 47 MSE: 0.035811301320791245
Epoch 48 MSE: 0.03573036193847656
Epoch 49 MSE: 0.03565020486712456
Epoch 50 MSE: 0.0355704128742218
Epoch 51 MSE: 0.03549035266041756
Epoch 52 MSE: 0.035409167408943176
Epoch 53 MSE: 0.03532585874199867
Epoch 54 MSE: 0.035239286720752716
Epoch 55 MSE: 0.035148199647665024
Epoch 56 MSE: 0.03505126014351845

```

Epoch 57 MSE: 0.034947045147418976
Epoch 58 MSE: 0.03483409434556961
Epoch 59 MSE: 0.0347108356654644
Epoch 60 MSE: 0.034575626254081726
Epoch 61 MSE: 0.034426718950271606
Epoch 62 MSE: 0.034262191504240036
Epoch 63 MSE: 0.034079935401678085
Epoch 64 MSE: 0.03387758135795593
Epoch 65 MSE: 0.033652424812316895
Epoch 66 MSE: 0.033401310443878174
Epoch 67 MSE: 0.03312057629227638
Epoch 68 MSE: 0.03280589357018471
Epoch 69 MSE: 0.032452140003442764
Epoch 70 MSE: 0.032053206115961075
Epoch 71 MSE: 0.031601835042238235
Epoch 72 MSE: 0.031089389696717262
Epoch 73 MSE: 0.030505599454045296
Epoch 74 MSE: 0.029838306829333305
Epoch 75 MSE: 0.029073188081383705
Epoch 76 MSE: 0.028193579986691475
Epoch 77 MSE: 0.027180442586541176
Epoch 78 MSE: 0.026012670248746872
Epoch 79 MSE: 0.02466801181435585
Epoch 80 MSE: 0.02312478981912136
Epoch 81 MSE: 0.021364819258451462
Epoch 82 MSE: 0.019377870485186577
Epoch 83 MSE: 0.01716766320168972
Epoch 84 MSE: 0.014759106561541557
Epoch 85 MSE: 0.012206139974296093
Epoch 86 MSE: 0.009600398130714893
Epoch 87 MSE: 0.007081704679876566
Epoch 88 MSE: 0.004850620403885841
Epoch 89 MSE: 0.003170698182657361
Epoch 90 MSE: 0.0023175168316811323
Epoch 91 MSE: 0.0024164870847016573
Epoch 92 MSE: 0.0032443059608340263
Epoch 93 MSE: 0.004305259324610233
Epoch 94 MSE: 0.005118384957313538
Epoch 95 MSE: 0.005328201223164797
Epoch 96 MSE: 0.004848814103752375
Epoch 97 MSE: 0.003943135961890221
Epoch 98 MSE: 0.002982157515361905
Epoch 99 MSE: 0.0021929971408098936
T-time: 4.738654851913452

```

```

=====
Train Score: 1.40 RMSE
=====

```

Validation Score: 16.53 RMSE

=====

=====

Time Step = 30 | Hidden States = 2 | Num Layers = 2

=====

Epoch	0	MSE:	0.03743020445108414
Epoch	1	MSE:	0.0355871319770813
Epoch	2	MSE:	0.03450414910912514
Epoch	3	MSE:	0.03415123373270035
Epoch	4	MSE:	0.03404003754258156
Epoch	5	MSE:	0.033559445291757584
Epoch	6	MSE:	0.03256857395172119
Epoch	7	MSE:	0.03121930919587612
Epoch	8	MSE:	0.029728256165981293
Epoch	9	MSE:	0.028313659131526947
Epoch	10	MSE:	0.027036404237151146
Epoch	11	MSE:	0.02555874176323414
Epoch	12	MSE:	0.023495953530073166
Epoch	13	MSE:	0.020929627120494843
Epoch	14	MSE:	0.018468277528882027
Epoch	15	MSE:	0.016617123037576675
Epoch	16	MSE:	0.01456636842340231
Epoch	17	MSE:	0.011684935539960861
Epoch	18	MSE:	0.009090748615562916
Epoch	19	MSE:	0.00794270634651184
Epoch	20	MSE:	0.006333993282169104
Epoch	21	MSE:	0.005575692746788263
Epoch	22	MSE:	0.005905823316425085
Epoch	23	MSE:	0.005458590108901262
Epoch	24	MSE:	0.006385055370628834
Epoch	25	MSE:	0.006017789244651794
Epoch	26	MSE:	0.00586643535643816
Epoch	27	MSE:	0.005482946988195181
Epoch	28	MSE:	0.0045054336078464985
Epoch	29	MSE:	0.003699104068800807
Epoch	30	MSE:	0.0031471154652535915
Epoch	31	MSE:	0.002577594481408596
Epoch	32	MSE:	0.0021188054233789444
Epoch	33	MSE:	0.0019277167739346623
Epoch	34	MSE:	0.0019430303946137428
Epoch	35	MSE:	0.00203618872910738
Epoch	36	MSE:	0.0021299428772181273
Epoch	37	MSE:	0.00220085890032351
Epoch	38	MSE:	0.002239403547719121
Epoch	39	MSE:	0.0022227929439395666
Epoch	40	MSE:	0.002125674393028021

Epoch	41	MSE:	0.0019518095068633556
Epoch	42	MSE:	0.0017453855834901333
Epoch	43	MSE:	0.0015644885133951902
Epoch	44	MSE:	0.0014430875889956951
Epoch	45	MSE:	0.0013799029402434826
Epoch	46	MSE:	0.0013597701909020543
Epoch	47	MSE:	0.0013743534218519926
Epoch	48	MSE:	0.001413844176568091
Epoch	49	MSE:	0.0014485323335975409
Epoch	50	MSE:	0.001442047650925815
Epoch	51	MSE:	0.0013869603862985969
Epoch	52	MSE:	0.0013064377708360553
Epoch	53	MSE:	0.0012208258267492056
Epoch	54	MSE:	0.0011358140036463737
Epoch	55	MSE:	0.001060860580764711
Epoch	56	MSE:	0.0010128882713615894
Epoch	57	MSE:	0.0009954317938536406
Epoch	58	MSE:	0.0009921352611854672
Epoch	59	MSE:	0.0009873128728941083
Epoch	60	MSE:	0.0009780462132766843
Epoch	61	MSE:	0.0009625210077501833
Epoch	62	MSE:	0.0009339737007394433
Epoch	63	MSE:	0.0008929171599447727
Epoch	64	MSE:	0.0008509823819622397
Epoch	65	MSE:	0.0008161578443832695
Epoch	66	MSE:	0.0007872273563407362
Epoch	67	MSE:	0.0007654805667698383
Epoch	68	MSE:	0.0007544835680164397
Epoch	69	MSE:	0.0007486286922357976
Epoch	70	MSE:	0.0007399423629976809
Epoch	71	MSE:	0.0007287512999027967
Epoch	72	MSE:	0.0007148710428737104
Epoch	73	MSE:	0.0006950623355805874
Epoch	74	MSE:	0.0006730344612151384
Epoch	75	MSE:	0.0006537439185194671
Epoch	76	MSE:	0.0006362751009874046
Epoch	77	MSE:	0.0006215344765223563
Epoch	78	MSE:	0.0006113455747254193
Epoch	79	MSE:	0.000602387881372124
Epoch	80	MSE:	0.0005924353026784956
Epoch	81	MSE:	0.0005821567610837519
Epoch	82	MSE:	0.0005699064349755645
Epoch	83	MSE:	0.0005554214003495872
Epoch	84	MSE:	0.0005412617465481162
Epoch	85	MSE:	0.0005276907468214631
Epoch	86	MSE:	0.000514964631292969
Epoch	87	MSE:	0.000504525494761765
Epoch	88	MSE:	0.000495183456223458

Epoch 89 MSE: 0.0004859785840380937
Epoch 90 MSE: 0.00047710436047054827
Epoch 91 MSE: 0.0004673246876336634
Epoch 92 MSE: 0.00045680641778744757
Epoch 93 MSE: 0.00044643765431828797
Epoch 94 MSE: 0.0004360149323474616
Epoch 95 MSE: 0.0004263759474270046
Epoch 96 MSE: 0.00041772486292757094
Epoch 97 MSE: 0.00040944688953459263
Epoch 98 MSE: 0.00040168905979953706
Epoch 99 MSE: 0.0003938573063351214
T-time: 8.240160703659058

=====
Train Score: 0.59 RMSE

=====
Validation Score: 13.14 RMSE
=====

=====
Time Step = 30 | Hidden States = 4 | Num Layers = 1
=====

Epoch 0 MSE: 0.04768358916044235
Epoch 1 MSE: 0.04032931476831436
Epoch 2 MSE: 0.03539516404271126
Epoch 3 MSE: 0.03230658173561096
Epoch 4 MSE: 0.030488386750221252
Epoch 5 MSE: 0.029353486374020576
Epoch 6 MSE: 0.028284458443522453
Epoch 7 MSE: 0.02681155502796173
Epoch 8 MSE: 0.02471536211669445
Epoch 9 MSE: 0.021992499008774757
Epoch 10 MSE: 0.018793504685163498
Epoch 11 MSE: 0.015380756929516792
Epoch 12 MSE: 0.012096523307263851
Epoch 13 MSE: 0.009302636608481407
Epoch 14 MSE: 0.007247005123645067
Epoch 15 MSE: 0.0058562736958265305
Epoch 16 MSE: 0.0047002024948596954
Epoch 17 MSE: 0.003452395088970661
Epoch 18 MSE: 0.0023222363088279963
Epoch 19 MSE: 0.0018869355553761125
Epoch 20 MSE: 0.0024983964394778013
Epoch 21 MSE: 0.0037401968147605658
Epoch 22 MSE: 0.004705153405666351
Epoch 23 MSE: 0.0048709437251091
Epoch 24 MSE: 0.004348276648670435

Epoch	25	MSE:	0.00355468038469553
Epoch	26	MSE:	0.0028616113122552633
Epoch	27	MSE:	0.0024030141066759825
Epoch	28	MSE:	0.002096304204314947
Epoch	29	MSE:	0.0018178171012550592
Epoch	30	MSE:	0.001538876909762621
Epoch	31	MSE:	0.0013157770736142993
Epoch	32	MSE:	0.001211556838825345
Epoch	33	MSE:	0.0012428341433405876
Epoch	34	MSE:	0.0013726343167945743
Epoch	35	MSE:	0.0015327882720157504
Epoch	36	MSE:	0.0016548993298783898
Epoch	37	MSE:	0.001694605452939868
Epoch	38	MSE:	0.0016417906153947115
Epoch	39	MSE:	0.0015167758101597428
Epoch	40	MSE:	0.001357093802653253
Epoch	41	MSE:	0.0012010388309136033
Epoch	42	MSE:	0.001073990948498249
Epoch	43	MSE:	0.000982323894277215
Epoch	44	MSE:	0.0009170204866677523
Epoch	45	MSE:	0.0008645985508337617
Epoch	46	MSE:	0.0008184402831830084
Epoch	47	MSE:	0.0007829301757737994
Epoch	48	MSE:	0.0007677828543819487
Epoch	49	MSE:	0.0007773470133543015
Epoch	50	MSE:	0.0008034452912397683
Epoch	51	MSE:	0.0008275149157270789
Epoch	52	MSE:	0.0008305917144753039
Epoch	53	MSE:	0.0008039528038352728
Epoch	54	MSE:	0.0007532594026997685
Epoch	55	MSE:	0.0006941388128325343
Epoch	56	MSE:	0.0006429271888919175
Epoch	57	MSE:	0.0006087152869440615
Epoch	58	MSE:	0.0005910219042561948
Epoch	59	MSE:	0.0005832096794620156
Epoch	60	MSE:	0.0005781917134299874
Epoch	61	MSE:	0.0005723327631130815
Epoch	62	MSE:	0.0005656683933921158
Epoch	63	MSE:	0.0005594874965026975
Epoch	64	MSE:	0.0005537805845960975
Epoch	65	MSE:	0.0005465205758810043
Epoch	66	MSE:	0.0005350173451006413
Epoch	67	MSE:	0.0005180928856134415
Epoch	68	MSE:	0.0004973631585016847
Epoch	69	MSE:	0.00047666492173448205
Epoch	70	MSE:	0.0004599762614816427
Epoch	71	MSE:	0.00044922379311174154
Epoch	72	MSE:	0.0004434347210917622


```

Epoch 73 MSE: 0.00043972901767119765
Epoch 74 MSE: 0.00043531920528039336
Epoch 75 MSE: 0.00042901127017103136
Epoch 76 MSE: 0.00042124351602979004
Epoch 77 MSE: 0.00041297596180811524
Epoch 78 MSE: 0.0004046024405397475
Epoch 79 MSE: 0.00039579978329129517
Epoch 80 MSE: 0.0003862298035528511
Epoch 81 MSE: 0.0003762508858926594
Epoch 82 MSE: 0.00036690745037049055
Epoch 83 MSE: 0.00035921050584875047
Epoch 84 MSE: 0.0003533698327373713
Epoch 85 MSE: 0.0003486369678284973
Epoch 86 MSE: 0.0003438586136326194
Epoch 87 MSE: 0.000338249170454219
Epoch 88 MSE: 0.0003317746741231531
Epoch 89 MSE: 0.00032493588514626026
Epoch 90 MSE: 0.00031824735924601555
Epoch 91 MSE: 0.00031189253786578774
Epoch 92 MSE: 0.0003057824505958706
Epoch 93 MSE: 0.00029984748107381165
Epoch 94 MSE: 0.00029421329963952303
Epoch 95 MSE: 0.00028908310923725367
Epoch 96 MSE: 0.0002844745758920908
Epoch 97 MSE: 0.00028010824462398887
Epoch 98 MSE: 0.000275581784080714
Epoch 99 MSE: 0.00027067199698649347
T-time: 7.86789608001709

```

```
=====
```

```
Train Score: 0.49 RMSE
```

```
=====
```

```
Validation Score: 10.05 RMSE
```

```
=====
```

```
=====
```

```
Time Step = 30 | Hidden States = 4 | Num Layers = 2
```

```
=====
```

```

Epoch 0 MSE: 0.3315909206867218
Epoch 1 MSE: 0.28969618678092957
Epoch 2 MSE: 0.25227662920951843
Epoch 3 MSE: 0.2190193086862564
Epoch 4 MSE: 0.18934200704097748
Epoch 5 MSE: 0.16263273358345032
Epoch 6 MSE: 0.13833776116371155
Epoch 7 MSE: 0.11604934930801392
Epoch 8 MSE: 0.09554965049028397

```

Epoch 9 MSE: 0.07685249298810959
Epoch 10 MSE: 0.0602487251162529
Epoch 11 MSE: 0.04632691293954849
Epoch 12 MSE: 0.03593353182077408
Epoch 13 MSE: 0.030014272779226303
Epoch 14 MSE: 0.02921491675078869
Epoch 15 MSE: 0.03308423236012459
Epoch 16 MSE: 0.03927772492170334
Epoch 17 MSE: 0.044544901698827744
Epoch 18 MSE: 0.046947821974754333
Epoch 19 MSE: 0.04635532572865486
Epoch 20 MSE: 0.043640799820423126
Epoch 21 MSE: 0.039933301508426666
Epoch 22 MSE: 0.03619994595646858
Epoch 23 MSE: 0.03307488188147545
Epoch 24 MSE: 0.030846115201711655
Epoch 25 MSE: 0.029531115666031837
Epoch 26 MSE: 0.028981784358620644
Epoch 27 MSE: 0.02897823043167591
Epoch 28 MSE: 0.02929363027215004
Epoch 29 MSE: 0.029730241745710373
Epoch 30 MSE: 0.030134323984384537
Epoch 31 MSE: 0.030398540198802948
Epoch 32 MSE: 0.030458081513643265
Epoch 33 MSE: 0.03028438240289688
Epoch 34 MSE: 0.029878191649913788
Epoch 35 MSE: 0.02926301769912243
Epoch 36 MSE: 0.02847890369594097
Epoch 37 MSE: 0.02757660672068596
Epoch 38 MSE: 0.02661190554499626
Epoch 39 MSE: 0.02563980594277382
Epoch 40 MSE: 0.024708623066544533
Epoch 41 MSE: 0.02385401725769043
Epoch 42 MSE: 0.023093514144420624
Epoch 43 MSE: 0.02242247574031353
Epoch 44 MSE: 0.021812841296195984
Epoch 45 MSE: 0.02121611125767231
Epoch 46 MSE: 0.020571328699588776
Epoch 47 MSE: 0.019817564636468887
Epoch 48 MSE: 0.018908360973000526
Epoch 49 MSE: 0.01782393455505371
Epoch 50 MSE: 0.016576804220676422
Epoch 51 MSE: 0.015208461321890354
Epoch 52 MSE: 0.013777991756796837
Epoch 53 MSE: 0.01234647911041975
Epoch 54 MSE: 0.010962605476379395
Epoch 55 MSE: 0.009653990156948566
Epoch 56 MSE: 0.008426513522863388

```

Epoch 57 MSE: 0.007271153386682272
Epoch 58 MSE: 0.00617600092664361
Epoch 59 MSE: 0.005139636807143688
Epoch 60 MSE: 0.004181316588073969
Epoch 61 MSE: 0.0033432231284677982
Epoch 62 MSE: 0.002681861398741603
Epoch 63 MSE: 0.002249526558443904
Epoch 64 MSE: 0.0020713743288069963
Epoch 65 MSE: 0.002126856241375208
Epoch 66 MSE: 0.002345130080357194
Epoch 67 MSE: 0.002622263738885522
Epoch 68 MSE: 0.0028575188480317593
Epoch 69 MSE: 0.0029873454477638006
Epoch 70 MSE: 0.002994094742462039
Epoch 71 MSE: 0.0028911568224430084
Epoch 72 MSE: 0.002704416401684284
Epoch 73 MSE: 0.002462470205500722
Epoch 74 MSE: 0.0021939200814813375
Epoch 75 MSE: 0.0019258251413702965
Epoch 76 MSE: 0.0016809216467663646
Epoch 77 MSE: 0.0014752080896869302
Epoch 78 MSE: 0.001317396992817521
Epoch 79 MSE: 0.0012097555445507169
Epoch 80 MSE: 0.001149256364442408
Epoch 81 MSE: 0.0011285949731245637
Epoch 82 MSE: 0.0011372918961569667
Epoch 83 MSE: 0.0011631760280579329
Epoch 84 MSE: 0.0011942230630666018
Epoch 85 MSE: 0.00122037751134485
Epoch 86 MSE: 0.0012348388554528356
Epoch 87 MSE: 0.0012344642309471965
Epoch 88 MSE: 0.0012192772701382637
Epoch 89 MSE: 0.0011914059286937118
Epoch 90 MSE: 0.0011539425468072295
Epoch 91 MSE: 0.0011101117124781013
Epoch 92 MSE: 0.0010629200842231512
Epoch 93 MSE: 0.0010151645401492715
Epoch 94 MSE: 0.0009695594781078398
Epoch 95 MSE: 0.0009287098655477166
Epoch 96 MSE: 0.000894845521543175
Epoch 97 MSE: 0.0008693881682120264
Epoch 98 MSE: 0.0008525796583853662
Epoch 99 MSE: 0.000843378365971148
T-time: 14.687498569488525

```

```

=====
Train Score: 0.87 RMSE
=====

```

Validation Score: 15.07 RMSE

=====

=====

Time Step = 30 | Hidden States = 8 | Num Layers = 1

=====

Epoch	0	MSE:	0.05830710008740425
Epoch	1	MSE:	0.04319801181554794
Epoch	2	MSE:	0.03298809751868248
Epoch	3	MSE:	0.027621813118457794
Epoch	4	MSE:	0.02664072997868061
Epoch	5	MSE:	0.028489967808127403
Epoch	6	MSE:	0.03042115457355976
Epoch	7	MSE:	0.030652599409222603
Epoch	8	MSE:	0.02918129228055477
Epoch	9	MSE:	0.026789866387844086
Epoch	10	MSE:	0.02427689917385578
Epoch	11	MSE:	0.022168666124343872
Epoch	12	MSE:	0.020675277337431908
Epoch	13	MSE:	0.019750501960515976
Epoch	14	MSE:	0.019184933975338936
Epoch	15	MSE:	0.018699269741773605
Epoch	16	MSE:	0.018023833632469177
Epoch	17	MSE:	0.016958730295300484
Epoch	18	MSE:	0.015411796048283577
Epoch	19	MSE:	0.013413450680673122
Epoch	20	MSE:	0.011110161431133747
Epoch	21	MSE:	0.008738277480006218
Epoch	22	MSE:	0.006574634928256273
Epoch	23	MSE:	0.004851405508816242
Epoch	24	MSE:	0.0036309717688709497
Epoch	25	MSE:	0.002727038459852338
Epoch	26	MSE:	0.0018949871882796288
Epoch	27	MSE:	0.0012286227429285645
Epoch	28	MSE:	0.0011715007713064551
Epoch	29	MSE:	0.0019882519263774157
Epoch	30	MSE:	0.003120464039966464
Epoch	31	MSE:	0.0035563751589506865
Epoch	32	MSE:	0.0029258837457746267
Epoch	33	MSE:	0.0016933819279074669
Epoch	34	MSE:	0.0006076114950701594
Epoch	35	MSE:	0.0001712307275738567
Epoch	36	MSE:	0.00038035493344068527
Epoch	37	MSE:	0.0008281996706500649
Epoch	38	MSE:	0.001097658067010343
Epoch	39	MSE:	0.001068838289938867
Epoch	40	MSE:	0.0008871317259036005

Epoch	41	MSE:	0.0007472841534763575
Epoch	42	MSE:	0.0007358352304436266
Epoch	43	MSE:	0.0008078821701928973
Epoch	44	MSE:	0.0008529640035703778
Epoch	45	MSE:	0.0007814120035618544
Epoch	46	MSE:	0.0005823375540785491
Epoch	47	MSE:	0.00033112018718384206
Epoch	48	MSE:	0.0001460440835217014
Epoch	49	MSE:	0.00011262156476732343
Epoch	50	MSE:	0.00021734654728788882
Epoch	51	MSE:	0.0003498413134366274
Epoch	52	MSE:	0.0003953797568101436
Epoch	53	MSE:	0.0003365898737683892
Epoch	54	MSE:	0.00025048901443369687
Epoch	55	MSE:	0.00021330371964722872
Epoch	56	MSE:	0.0002300985506735742
Epoch	57	MSE:	0.00025075156008824706
Epoch	58	MSE:	0.00023112430062610656
Epoch	59	MSE:	0.00017255335114896297
Epoch	60	MSE:	0.00011382836237316951
Epoch	61	MSE:	9.392945503350347e-05
Epoch	62	MSE:	0.00011975511733908206
Epoch	63	MSE:	0.00016325755859725177
Epoch	64	MSE:	0.00018736998026724905
Epoch	65	MSE:	0.00017625004693400115
Epoch	66	MSE:	0.0001436006132280454
Epoch	67	MSE:	0.00011548212933121249
Epoch	68	MSE:	0.00010695721721276641
Epoch	69	MSE:	0.00011299804464215413
Epoch	70	MSE:	0.00011777529289247468
Epoch	71	MSE:	0.00011089642066508532
Epoch	72	MSE:	9.601886267773807e-05
Epoch	73	MSE:	8.573175000492483e-05
Epoch	74	MSE:	8.854078623699024e-05
Epoch	75	MSE:	0.00010042238136520609
Epoch	76	MSE:	0.00010900451161433011
Epoch	77	MSE:	0.00010582134564174339
Epoch	78	MSE:	9.37376607907936e-05
Epoch	79	MSE:	8.258123853011057e-05
Epoch	80	MSE:	7.910842396086082e-05
Epoch	81	MSE:	8.196032285923138e-05
Epoch	82	MSE:	8.506155427312478e-05
Epoch	83	MSE:	8.427391003351659e-05
Epoch	84	MSE:	8.059835090534762e-05
Epoch	85	MSE:	7.792432006681338e-05
Epoch	86	MSE:	7.852623821236193e-05
Epoch	87	MSE:	8.089409675449133e-05
Epoch	88	MSE:	8.163245365722105e-05

```

Epoch 89 MSE: 7.906415703473613e-05
Epoch 90 MSE: 7.476947212126106e-05
Epoch 91 MSE: 7.176354120019823e-05
Epoch 92 MSE: 7.152914622565731e-05
Epoch 93 MSE: 7.294148963410407e-05
Epoch 94 MSE: 7.380501483567059e-05
Epoch 95 MSE: 7.308138447115198e-05
Epoch 96 MSE: 7.155525963753462e-05
Epoch 97 MSE: 7.0587957452517e-05
Epoch 98 MSE: 7.05539423506707e-05
Epoch 99 MSE: 7.062112126732245e-05
T-time: 6.5735087394714355

```

```

=====
Train Score: 0.25 RMSE
=====
Validation Score: 5.80 RMSE
=====

```

```

=====
Time Step = 30 | Hidden States = 8 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.1300494223833084
Epoch 1 MSE: 0.09953387081623077
Epoch 2 MSE: 0.07576581835746765
Epoch 3 MSE: 0.057945769280195236
Epoch 4 MSE: 0.04546254500746727
Epoch 5 MSE: 0.03796081990003586
Epoch 6 MSE: 0.0351751372218132
Epoch 7 MSE: 0.036429472267627716
Epoch 8 MSE: 0.03985827788710594
Epoch 9 MSE: 0.04278193786740303
Epoch 10 MSE: 0.0436619408428669
Epoch 11 MSE: 0.04255641624331474
Epoch 12 MSE: 0.04026862233877182
Epoch 13 MSE: 0.03766671195626259
Epoch 14 MSE: 0.035382479429244995
Epoch 15 MSE: 0.03373955190181732
Epoch 16 MSE: 0.032797280699014664
Epoch 17 MSE: 0.032437391579151154
Epoch 18 MSE: 0.032448574900627136
Epoch 19 MSE: 0.03258895501494408
Epoch 20 MSE: 0.032627690583467484
Epoch 21 MSE: 0.03237408772110939
Epoch 22 MSE: 0.03169442340731621
Epoch 23 MSE: 0.030512342229485512
Epoch 24 MSE: 0.028797175735235214

```

Epoch	25	MSE:	0.026554090902209282
Epoch	26	MSE:	0.023837115615606308
Epoch	27	MSE:	0.020796095952391624
Epoch	28	MSE:	0.0177303459495306
Epoch	29	MSE:	0.014974850229918957
Epoch	30	MSE:	0.012396407313644886
Epoch	31	MSE:	0.009321870282292366
Epoch	32	MSE:	0.005870421417057514
Epoch	33	MSE:	0.004070761147886515
Epoch	34	MSE:	0.005253431387245655
Epoch	35	MSE:	0.007208575028926134
Epoch	36	MSE:	0.0077842650935053825
Epoch	37	MSE:	0.007167050614953041
Epoch	38	MSE:	0.006029353942722082
Epoch	39	MSE:	0.004854240920394659
Epoch	40	MSE:	0.004056863021105528
Epoch	41	MSE:	0.003737029852345586
Epoch	42	MSE:	0.0035468998830765486
Epoch	43	MSE:	0.00327903195284307
Epoch	44	MSE:	0.003115979256108403
Epoch	45	MSE:	0.0031828295905143023
Epoch	46	MSE:	0.003396661253646016
Epoch	47	MSE:	0.0036187663208693266
Epoch	48	MSE:	0.0037005252670496702
Epoch	49	MSE:	0.003563558217138052
Epoch	50	MSE:	0.00323143950663507
Epoch	51	MSE:	0.00280407490208745
Epoch	52	MSE:	0.002407819963991642
Epoch	53	MSE:	0.0021407180465757847
Epoch	54	MSE:	0.002030876697972417
Epoch	55	MSE:	0.0020304254721850157
Epoch	56	MSE:	0.002047371817752719
Epoch	57	MSE:	0.002005287678912282
Epoch	58	MSE:	0.001887033460661769
Epoch	59	MSE:	0.001726918970234692
Epoch	60	MSE:	0.0015691373264417052
Epoch	61	MSE:	0.0014344076626002789
Epoch	62	MSE:	0.0013182924594730139
Epoch	63	MSE:	0.001212786533869803
Epoch	64	MSE:	0.0011240056483075023
Epoch	65	MSE:	0.00106747483368963
Epoch	66	MSE:	0.0010473327711224556
Epoch	67	MSE:	0.0010421492625027895
Epoch	68	MSE:	0.0010153399780392647
Epoch	69	MSE:	0.0009448613272979856
Epoch	70	MSE:	0.0008440824458375573
Epoch	71	MSE:	0.0007511386647820473
Epoch	72	MSE:	0.0006963096675463021

```
Epoch 73 MSE: 0.0006787938182242215
Epoch 74 MSE: 0.000672296853736043
Epoch 75 MSE: 0.0006503849872387946
Epoch 76 MSE: 0.0006069624796509743
Epoch 77 MSE: 0.0005555611569434404
Epoch 78 MSE: 0.0005118214758113027
Epoch 79 MSE: 0.0004782472678925842
Epoch 80 MSE: 0.0004464737721718848
Epoch 81 MSE: 0.0004119609948247671
Epoch 82 MSE: 0.00038102411781437695
Epoch 83 MSE: 0.00036125080077908933
Epoch 84 MSE: 0.0003493304247967899
Epoch 85 MSE: 0.0003330550971440971
Epoch 86 MSE: 0.00030511137447319925
Epoch 87 MSE: 0.00027184654027223587
Epoch 88 MSE: 0.00024648834369145334
Epoch 89 MSE: 0.00023436792253050953
Epoch 90 MSE: 0.0002276333252666518
Epoch 91 MSE: 0.00021590496180579066
Epoch 92 MSE: 0.0001983940601348877
Epoch 93 MSE: 0.00018163725326303393
Epoch 94 MSE: 0.00016873845015652478
Epoch 95 MSE: 0.00015682469529565424
Epoch 96 MSE: 0.0001442001957911998
Epoch 97 MSE: 0.00013384973863139749
Epoch 98 MSE: 0.00012754503404721618
Epoch 99 MSE: 0.00012116150901420042
T-time: 11.877559900283813
```

```
=====
Train Score: 0.33 RMSE
=====
Validation Score: 12.10 RMSE
=====
```

```
=====
Time Step = 30 | Hidden States = 16 | Num Layers = 1
=====
```

```
Epoch 0 MSE: 0.03280074521899223
Epoch 1 MSE: 0.030688747763633728
Epoch 2 MSE: 0.028223611414432526
Epoch 3 MSE: 0.025945521891117096
Epoch 4 MSE: 0.023057380691170692
Epoch 5 MSE: 0.020216742530465126
Epoch 6 MSE: 0.016408327966928482
Epoch 7 MSE: 0.011782833375036716
Epoch 8 MSE: 0.0068675195798277855
```


Epoch 9 MSE: 0.00167743896599859
 Epoch 10 MSE: 0.0012243869714438915
 Epoch 11 MSE: 0.009534423239529133
 Epoch 12 MSE: 0.005961210932582617
 Epoch 13 MSE: 0.0036349850706756115
 Epoch 14 MSE: 0.000371886562788859
 Epoch 15 MSE: 0.0006170365959405899
 Epoch 16 MSE: 0.0015756768407300115
 Epoch 17 MSE: 0.0017671105451881886
 Epoch 18 MSE: 0.0019920116756111383
 Epoch 19 MSE: 0.0025295407976955175
 Epoch 20 MSE: 0.0027896156534552574
 Epoch 21 MSE: 0.002443931996822357
 Epoch 22 MSE: 0.001866919337771833
 Epoch 23 MSE: 0.001481905928812921
 Epoch 24 MSE: 0.0012076423736289144
 Epoch 25 MSE: 0.0007517654448747635
 Epoch 26 MSE: 0.00023919958039186895
 Epoch 27 MSE: 0.00010877213208004832
 Epoch 28 MSE: 0.0003461726591922343
 Epoch 29 MSE: 0.0004942378727719188
 Epoch 30 MSE: 0.0005734095466323197
 Epoch 31 MSE: 0.0007965457625687122
 Epoch 32 MSE: 0.0008422203827649355
 Epoch 33 MSE: 0.0005706222145818174
 Epoch 34 MSE: 0.00033739974605850875
 Epoch 35 MSE: 0.00025112341972999275
 Epoch 36 MSE: 0.00014808526611886919
 Epoch 37 MSE: 6.950321403564885e-05
 Epoch 38 MSE: 0.00012719356163870543
 Epoch 39 MSE: 0.00024090603983495384
 Epoch 40 MSE: 0.00028710748301818967
 Epoch 41 MSE: 0.00028150028083473444
 Epoch 42 MSE: 0.00028913296409882605
 Epoch 43 MSE: 0.00028784488677047193
 Epoch 44 MSE: 0.00022641062969341874
 Epoch 45 MSE: 0.00013911040150560439
 Epoch 46 MSE: 9.39742021728307e-05
 Epoch 47 MSE: 8.34099409985356e-05
 Epoch 48 MSE: 6.718535587424412e-05
 Epoch 49 MSE: 6.499709706986323e-05
 Epoch 50 MSE: 0.00010230411862721667
 Epoch 51 MSE: 0.00013571100134868175
 Epoch 52 MSE: 0.00013091351138427854
 Epoch 53 MSE: 0.00011768293188652024
 Epoch 54 MSE: 0.00010897273750742897
 Epoch 55 MSE: 8.383749809581786e-05
 Epoch 56 MSE: 5.4140622523846105e-05

Epoch 57 MSE: 4.7611494665034115e-05
Epoch 58 MSE: 5.5066626373445615e-05
Epoch 59 MSE: 5.7906327128876e-05
Epoch 60 MSE: 6.282963295234367e-05
Epoch 61 MSE: 7.417233427986503e-05
Epoch 62 MSE: 7.768218347337097e-05
Epoch 63 MSE: 6.891259545227513e-05
Epoch 64 MSE: 6.0271639085840434e-05
Epoch 65 MSE: 5.523308936972171e-05
Epoch 66 MSE: 4.7454243031097576e-05
Epoch 67 MSE: 4.116450509172864e-05
Epoch 68 MSE: 4.3529129470698535e-05
Epoch 69 MSE: 4.8518184485146776e-05
Epoch 70 MSE: 4.992575486539863e-05
Epoch 71 MSE: 5.144866372575052e-05
Epoch 72 MSE: 5.298330506775528e-05
Epoch 73 MSE: 4.970190275344066e-05
Epoch 74 MSE: 4.459008414414711e-05
Epoch 75 MSE: 4.248643745086156e-05
Epoch 76 MSE: 4.134280243306421e-05
Epoch 77 MSE: 4.010135307908058e-05
Epoch 78 MSE: 4.1322065953863785e-05
Epoch 79 MSE: 4.3666703277267516e-05
Epoch 80 MSE: 4.402926788316108e-05
Epoch 81 MSE: 4.34601133747492e-05
Epoch 82 MSE: 4.3149455450475216e-05
Epoch 83 MSE: 4.173212801106274e-05
Epoch 84 MSE: 3.9766284317011014e-05
Epoch 85 MSE: 3.921073584933765e-05
Epoch 86 MSE: 3.940981696359813e-05
Epoch 87 MSE: 3.9392340113408864e-05
Epoch 88 MSE: 3.992976053268649e-05
Epoch 89 MSE: 4.0627928683534265e-05
Epoch 90 MSE: 4.034208905068226e-05
Epoch 91 MSE: 3.9702073991065845e-05
Epoch 92 MSE: 3.9311791624641046e-05
Epoch 93 MSE: 3.868888597935438e-05
Epoch 94 MSE: 3.8179427065188065e-05
Epoch 95 MSE: 3.831719732261263e-05
Epoch 96 MSE: 3.8530455640284345e-05
Epoch 97 MSE: 3.854845272144303e-05
Epoch 98 MSE: 3.86751999030821e-05
Epoch 99 MSE: 3.8631678762612864e-05
T-time: 12.761028528213501

=====
Train Score: 0.19 RMSE
=====

Validation Score: 5.04 RMSE

=====

=====

Time Step = 30 | Hidden States = 16 | Num Layers = 2

=====

Epoch	0	MSE:	0.055677399039268494
Epoch	1	MSE:	0.040503811091184616
Epoch	2	MSE:	0.03618287295103073
Epoch	3	MSE:	0.03912533447146416
Epoch	4	MSE:	0.03800801560282707
Epoch	5	MSE:	0.0355929397046566
Epoch	6	MSE:	0.03420901671051979
Epoch	7	MSE:	0.033764105290174484
Epoch	8	MSE:	0.03366672620177269
Epoch	9	MSE:	0.03346261382102966
Epoch	10	MSE:	0.03288586810231209
Epoch	11	MSE:	0.031801071017980576
Epoch	12	MSE:	0.030145179480314255
Epoch	13	MSE:	0.027899902313947678
Epoch	14	MSE:	0.02511209435760975
Epoch	15	MSE:	0.021848421543836594
Epoch	16	MSE:	0.017792847007513046
Epoch	17	MSE:	0.01196269504725933
Epoch	18	MSE:	0.004973718896508217
Epoch	19	MSE:	0.0016540931537747383
Epoch	20	MSE:	0.0049809678457677364
Epoch	21	MSE:	0.008692225441336632
Epoch	22	MSE:	0.008817782625555992
Epoch	23	MSE:	0.006266159936785698
Epoch	24	MSE:	0.0033147712238132954
Epoch	25	MSE:	0.0016409946838393807
Epoch	26	MSE:	0.001533445087261498
Epoch	27	MSE:	0.002230450976639986
Epoch	28	MSE:	0.0029366740491241217
Epoch	29	MSE:	0.003370483871549368
Epoch	30	MSE:	0.003472281387075782
Epoch	31	MSE:	0.0031549991108477116
Epoch	32	MSE:	0.0024629198014736176
Epoch	33	MSE:	0.0016888439422473311
Epoch	34	MSE:	0.0012349814642220736
Epoch	35	MSE:	0.0012144397478550673
Epoch	36	MSE:	0.0013073538430035114
Epoch	37	MSE:	0.0013889052206650376
Epoch	38	MSE:	0.0016057435423135757
Epoch	39	MSE:	0.0017785397358238697
Epoch	40	MSE:	0.0016250221524387598

Epoch 41 MSE: 0.001265931990928948
 Epoch 42 MSE: 0.0009930352680385113
 Epoch 43 MSE: 0.0008105839369818568
 Epoch 44 MSE: 0.0006444983300752938
 Epoch 45 MSE: 0.000617695041000843
 Epoch 46 MSE: 0.000749667757190764
 Epoch 47 MSE: 0.0008564441814087331
 Epoch 48 MSE: 0.0008264322532340884
 Epoch 49 MSE: 0.0007106576813384891
 Epoch 50 MSE: 0.0005649556987918913
 Epoch 51 MSE: 0.0003955152933485806
 Epoch 52 MSE: 0.0002761985524557531
 Epoch 53 MSE: 0.00028132234001532197
 Epoch 54 MSE: 0.0003392184153199196
 Epoch 55 MSE: 0.000359881145413965
 Epoch 56 MSE: 0.00033746351255103946
 Epoch 57 MSE: 0.0002538826083764434
 Epoch 58 MSE: 0.0001430270349374041
 Epoch 59 MSE: 9.947580110747367e-05
 Epoch 60 MSE: 0.00012158887693658471
 Epoch 61 MSE: 0.0001715253893053159
 Epoch 62 MSE: 0.00019678282842505723
 Epoch 63 MSE: 0.0001476809848099947
 Epoch 64 MSE: 8.280356996692717e-05
 Epoch 65 MSE: 5.92003452766221e-05
 Epoch 66 MSE: 8.276724111055955e-05
 Epoch 67 MSE: 0.00012398183753248304
 Epoch 68 MSE: 0.0001228511391673237
 Epoch 69 MSE: 9.368485189042985e-05
 Epoch 70 MSE: 5.957946632406674e-05
 Epoch 71 MSE: 6.0087553720222786e-05
 Epoch 72 MSE: 8.660316962050274e-05
 Epoch 73 MSE: 9.70651744864881e-05
 Epoch 74 MSE: 8.488124149153009e-05
 Epoch 75 MSE: 5.843230610480532e-05
 Epoch 76 MSE: 5.572663576458581e-05
 Epoch 77 MSE: 6.661871884716675e-05
 Epoch 78 MSE: 7.614732021465898e-05
 Epoch 79 MSE: 7.016583549557254e-05
 Epoch 80 MSE: 5.424419941846281e-05
 Epoch 81 MSE: 4.963499304722063e-05
 Epoch 82 MSE: 5.329150371835567e-05
 Epoch 83 MSE: 6.1557482695207e-05
 Epoch 84 MSE: 5.824673280585557e-05
 Epoch 85 MSE: 4.9865957407746464e-05
 Epoch 86 MSE: 4.536324559012428e-05
 Epoch 87 MSE: 4.7456756874453276e-05
 Epoch 88 MSE: 5.256841177470051e-05

```

Epoch 89 MSE: 5.1165978220524266e-05
Epoch 90 MSE: 4.707567495643161e-05
Epoch 91 MSE: 4.3243861000519246e-05
Epoch 92 MSE: 4.465473466552794e-05
Epoch 93 MSE: 4.7454908781219274e-05
Epoch 94 MSE: 4.737619019579142e-05
Epoch 95 MSE: 4.484019518713467e-05
Epoch 96 MSE: 4.232069477438927e-05
Epoch 97 MSE: 4.317292768973857e-05
Epoch 98 MSE: 4.456492024473846e-05
Epoch 99 MSE: 4.4821561459684744e-05
T-time: 26.2824227809906

```

```

=====
Train Score: 0.20 RMSE
=====
Validation Score: 5.29 RMSE
=====

```

```

=====
Time Step = 30 | Hidden States = 32 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.05470864847302437
Epoch 1 MSE: 0.036521151661872864
Epoch 2 MSE: 0.0323270820081234
Epoch 3 MSE: 0.03476791828870773
Epoch 4 MSE: 0.03283500298857689
Epoch 5 MSE: 0.02830059453845024
Epoch 6 MSE: 0.0245965588837862
Epoch 7 MSE: 0.02229919843375683
Epoch 8 MSE: 0.020366504788398743
Epoch 9 MSE: 0.017207302153110504
Epoch 10 MSE: 0.011177390813827515
Epoch 11 MSE: 0.002853731159120798
Epoch 12 MSE: 0.01857912354171276
Epoch 13 MSE: 0.002731408691033721
Epoch 14 MSE: 0.0025078372564166784
Epoch 15 MSE: 0.007131141144782305
Epoch 16 MSE: 0.008809547871351242
Epoch 17 MSE: 0.007310802582651377
Epoch 18 MSE: 0.0042012473568320274
Epoch 19 MSE: 0.0015075996052473783
Epoch 20 MSE: 0.00108303630258888
Epoch 21 MSE: 0.003040881594642997
Epoch 22 MSE: 0.004525488708168268
Epoch 23 MSE: 0.0033464115113019943
Epoch 24 MSE: 0.0011872209142893553

```

Epoch	25	MSE:	0.0002509352925699204
Epoch	26	MSE:	0.0007829103851690888
Epoch	27	MSE:	0.0017963368445634842
Epoch	28	MSE:	0.0023104152642190456
Epoch	29	MSE:	0.0019738844130188227
Epoch	30	MSE:	0.0011101920390501618
Epoch	31	MSE:	0.0003889810177497566
Epoch	32	MSE:	0.0003182347572874278
Epoch	33	MSE:	0.0008075948571786284
Epoch	34	MSE:	0.001228843117132783
Epoch	35	MSE:	0.0011098356917500496
Epoch	36	MSE:	0.0006317998631857336
Epoch	37	MSE:	0.0002763795491773635
Epoch	38	MSE:	0.0002739683259278536
Epoch	39	MSE:	0.0005055696237832308
Epoch	40	MSE:	0.000719877309165895
Epoch	41	MSE:	0.0007443659123964608
Epoch	42	MSE:	0.0005712505080737174
Epoch	43	MSE:	0.00033099157735705376
Epoch	44	MSE:	0.00019156307098455727
Epoch	45	MSE:	0.00023239065194502473
Epoch	46	MSE:	0.0003758188395295292
Epoch	47	MSE:	0.00045825494453310966
Epoch	48	MSE:	0.00039614835986867547
Epoch	49	MSE:	0.00026106322184205055
Epoch	50	MSE:	0.00017998585826717317
Epoch	51	MSE:	0.00020134798251092434
Epoch	52	MSE:	0.00027185663930140436
Epoch	53	MSE:	0.00030934979440644383
Epoch	54	MSE:	0.0002779447822831571
Epoch	55	MSE:	0.00020721962209790945
Epoch	56	MSE:	0.0001565559214213863
Epoch	57	MSE:	0.00016073670121841133
Epoch	58	MSE:	0.0002013572520809248
Epoch	59	MSE:	0.00022872760018799454
Epoch	60	MSE:	0.00021289402502588928
Epoch	61	MSE:	0.00017014981131069362
Epoch	62	MSE:	0.0001395737926941365
Epoch	63	MSE:	0.00014153328083921224
Epoch	64	MSE:	0.00016270403284579515
Epoch	65	MSE:	0.0001753073011059314
Epoch	66	MSE:	0.0001651574275456369
Epoch	67	MSE:	0.00014217189163900912
Epoch	68	MSE:	0.00012724872794933617
Epoch	69	MSE:	0.00013039351324550807
Epoch	70	MSE:	0.00014193450624588877
Epoch	71	MSE:	0.00014503482088912278
Epoch	72	MSE:	0.00013450204278342426

```
Epoch 73 MSE: 0.00012048503413097933
Epoch 74 MSE: 0.00011513882782310247
Epoch 75 MSE: 0.0001197191231767647
Epoch 76 MSE: 0.00012542733747977763
Epoch 77 MSE: 0.000124073339975439
Epoch 78 MSE: 0.00011604299652390182
Epoch 79 MSE: 0.00010844051575986668
Epoch 80 MSE: 0.00010681503772502765
Epoch 81 MSE: 0.00010962025407934561
Epoch 82 MSE: 0.00011092679051216692
Epoch 83 MSE: 0.00010757789277704433
Epoch 84 MSE: 0.00010223565914202482
Epoch 85 MSE: 9.938442963175476e-05
Epoch 86 MSE: 9.996162407333031e-05
Epoch 87 MSE: 0.00010093436867464334
Epoch 88 MSE: 9.938366565620527e-05
Epoch 89 MSE: 9.574959403835237e-05
Epoch 90 MSE: 9.280792437493801e-05
Epoch 91 MSE: 9.218666673405096e-05
Epoch 92 MSE: 9.268477151636034e-05
Epoch 93 MSE: 9.206966933561489e-05
Epoch 94 MSE: 8.98023572517559e-05
Epoch 95 MSE: 8.736984455026686e-05
Epoch 96 MSE: 8.620377775514498e-05
Epoch 97 MSE: 8.603101741755381e-05
Epoch 98 MSE: 8.550818893127143e-05
Epoch 99 MSE: 8.399422949878499e-05
T-time: 32.613932371139526
```

```
=====
Train Score: 0.27 RMSE
=====
Validation Score: 6.35 RMSE
=====
```

```
=====
Time Step = 30 | Hidden States = 32 | Num Layers = 2
=====
```

```
Epoch 0 MSE: 0.04066479206085205
Epoch 1 MSE: 0.04282337427139282
Epoch 2 MSE: 0.03622611612081528
Epoch 3 MSE: 0.03295174241065979
Epoch 4 MSE: 0.032573405653238297
Epoch 5 MSE: 0.030970308929681778
Epoch 6 MSE: 0.02628113515675068
Epoch 7 MSE: 0.019454628229141235
Epoch 8 MSE: 0.014128321781754494
```

Epoch 9 MSE: 0.008237452246248722
Epoch 10 MSE: 0.0007816554279997945
Epoch 11 MSE: 0.009618021547794342
Epoch 12 MSE: 0.0068541052751243114
Epoch 13 MSE: 0.0023689197842031717
Epoch 14 MSE: 0.0008074096986092627
Epoch 15 MSE: 0.0017288925591856241
Epoch 16 MSE: 0.0033664735965430737
Epoch 17 MSE: 0.003948204219341278
Epoch 18 MSE: 0.0033132373355329037
Epoch 19 MSE: 0.002091200789436698
Epoch 20 MSE: 0.0012272250605747104
Epoch 21 MSE: 0.0008903286652639508
Epoch 22 MSE: 0.0008613553363829851
Epoch 23 MSE: 0.0014672279357910156
Epoch 24 MSE: 0.0019035344012081623
Epoch 25 MSE: 0.001712633529677987
Epoch 26 MSE: 0.0013297213008627295
Epoch 27 MSE: 0.0008715148433111608
Epoch 28 MSE: 0.000475468608783558
Epoch 29 MSE: 0.00047271509538404644
Epoch 30 MSE: 0.0007184622809290886
Epoch 31 MSE: 0.0009349229512736201
Epoch 32 MSE: 0.0009985348442569375
Epoch 33 MSE: 0.0008878808002918959
Epoch 34 MSE: 0.0006474917754530907
Epoch 35 MSE: 0.000412375753512606
Epoch 36 MSE: 0.00032761870534159243
Epoch 37 MSE: 0.0004058636259287596
Epoch 38 MSE: 0.0005338805494830012
Epoch 39 MSE: 0.0005942605785094202
Epoch 40 MSE: 0.0005368897691369057
Epoch 41 MSE: 0.000394916016375646
Epoch 42 MSE: 0.0002667429798748344
Epoch 43 MSE: 0.00022818561410531402
Epoch 44 MSE: 0.00027062196750193834
Epoch 45 MSE: 0.000332094234181568
Epoch 46 MSE: 0.00035305367782711983
Epoch 47 MSE: 0.0003120574401691556
Epoch 48 MSE: 0.0002359386853640899
Epoch 49 MSE: 0.00017592588847037405
Epoch 50 MSE: 0.00016472756396979094
Epoch 51 MSE: 0.00019344253814779222
Epoch 52 MSE: 0.0002239882742287591
Epoch 53 MSE: 0.0002221837203251198
Epoch 54 MSE: 0.00018617014575283974
Epoch 55 MSE: 0.00014425927656702697
Epoch 56 MSE: 0.0001252415095223114

Epoch 57 MSE: 0.0001341134775429964
Epoch 58 MSE: 0.00015219670603983104
Epoch 59 MSE: 0.00015635331510566175
Epoch 60 MSE: 0.0001395325525663793
Epoch 61 MSE: 0.00011437480134190992
Epoch 62 MSE: 9.917836723616347e-05
Epoch 63 MSE: 0.00010134679905604571
Epoch 64 MSE: 0.00011165325122419745
Epoch 65 MSE: 0.00011432361498009413
Epoch 66 MSE: 0.00010377053695265204
Epoch 67 MSE: 8.87196947587654e-05
Epoch 68 MSE: 8.098907710518688e-05
Epoch 69 MSE: 8.359929051948711e-05
Epoch 70 MSE: 8.898750820662826e-05
Epoch 71 MSE: 8.809736027615145e-05
Epoch 72 MSE: 8.007174619706348e-05
Epoch 73 MSE: 7.161980465753004e-05
Epoch 74 MSE: 6.892096280353144e-05
Epoch 75 MSE: 7.148572331061587e-05
Epoch 76 MSE: 7.321628072531894e-05
Epoch 77 MSE: 6.988851964706555e-05
Epoch 78 MSE: 6.387493340298533e-05
Epoch 79 MSE: 6.013064557919279e-05
Epoch 80 MSE: 6.031760494806804e-05
Epoch 81 MSE: 6.160903285490349e-05
Epoch 82 MSE: 6.039479558239691e-05
Epoch 83 MSE: 5.6693548685871065e-05
Epoch 84 MSE: 5.356086330721155e-05
Epoch 85 MSE: 5.2929637604393065e-05
Epoch 86 MSE: 5.362962474464439e-05
Epoch 87 MSE: 5.312350913300179e-05
Epoch 88 MSE: 5.079582842881791e-05
Epoch 89 MSE: 4.851071207667701e-05
Epoch 90 MSE: 4.77678986499086e-05
Epoch 91 MSE: 4.79848422401119e-05
Epoch 92 MSE: 4.755291956826113e-05
Epoch 93 MSE: 4.596020880853757e-05
Epoch 94 MSE: 4.435632945387624e-05
Epoch 95 MSE: 4.374930722406134e-05
Epoch 96 MSE: 4.372949479147792e-05
Epoch 97 MSE: 4.32433262176346e-05
Epoch 98 MSE: 4.205634104437195e-05
Epoch 99 MSE: 4.0997343603521585e-05
T-time: 74.39237594604492

=====
Train Score: 0.19 RMSE
=====

Validation Score: 3.40 RMSE

=====

=====

Time Step = 50 | Hidden States = 2 | Num Layers = 1

=====

Epoch	0	MSE:	0.09306449443101883
Epoch	1	MSE:	0.0849897563457489
Epoch	2	MSE:	0.07802458107471466
Epoch	3	MSE:	0.07201243191957474
Epoch	4	MSE:	0.06681295484304428
Epoch	5	MSE:	0.0623052716255188
Epoch	6	MSE:	0.058388225734233856
Epoch	7	MSE:	0.05497819930315018
Epoch	8	MSE:	0.05200657993555069
Epoch	9	MSE:	0.049417223781347275
Epoch	10	MSE:	0.04716411605477333
Epoch	11	MSE:	0.04520928114652634
Epoch	12	MSE:	0.0435209795832634
Epoch	13	MSE:	0.042072221636772156
Epoch	14	MSE:	0.04083946719765663
Epoch	15	MSE:	0.03980174660682678
Epoch	16	MSE:	0.03893987089395523
Epoch	17	MSE:	0.03823590278625488
Epoch	18	MSE:	0.03767281025648117
Epoch	19	MSE:	0.03723420575261116
Epoch	20	MSE:	0.036904264241456985
Epoch	21	MSE:	0.036667678505182266
Epoch	22	MSE:	0.03650972247123718
Epoch	23	MSE:	0.03641635179519653
Epoch	24	MSE:	0.036374349147081375
Epoch	25	MSE:	0.03637146204710007
Epoch	26	MSE:	0.03639652580022812
Epoch	27	MSE:	0.03643961623311043
Epoch	28	MSE:	0.03649212419986725
Epoch	29	MSE:	0.03654680401086807
Epoch	30	MSE:	0.036597780883312225
Epoch	31	MSE:	0.03664054349064827
Epoch	32	MSE:	0.03667183220386505
Epoch	33	MSE:	0.036689575761556625
Epoch	34	MSE:	0.03669270873069763
Epoch	35	MSE:	0.03668108955025673
Epoch	36	MSE:	0.03665526956319809
Epoch	37	MSE:	0.03661637008190155
Epoch	38	MSE:	0.036565907299518585
Epoch	39	MSE:	0.036505650728940964
Epoch	40	MSE:	0.036437466740608215

Epoch	41	MSE:	0.03636322543025017
Epoch	42	MSE:	0.0362846814095974
Epoch	43	MSE:	0.03620341792702675
Epoch	44	MSE:	0.03612075746059418
Epoch	45	MSE:	0.036037739366292953
Epoch	46	MSE:	0.03595511615276337
Epoch	47	MSE:	0.03587330877780914
Epoch	48	MSE:	0.03579244390130043
Epoch	49	MSE:	0.035712357610464096
Epoch	50	MSE:	0.035632628947496414
Epoch	51	MSE:	0.03555260971188545
Epoch	52	MSE:	0.03547144681215286
Epoch	53	MSE:	0.035388123244047165
Epoch	54	MSE:	0.03530150279402733
Epoch	55	MSE:	0.035210322588682175
Epoch	56	MSE:	0.03511323779821396
Epoch	57	MSE:	0.03500884771347046
Epoch	58	MSE:	0.034895654767751694
Epoch	59	MSE:	0.034772101789712906
Epoch	60	MSE:	0.034636545926332474
Epoch	61	MSE:	0.034487225115299225
Epoch	62	MSE:	0.03432222828269005
Epoch	63	MSE:	0.03413942828774452
Epoch	64	MSE:	0.03393644839525223
Epoch	65	MSE:	0.03371056541800499
Epoch	66	MSE:	0.03345863148570061
Epoch	67	MSE:	0.03317695111036301
Epoch	68	MSE:	0.03286118060350418
Epoch	69	MSE:	0.032506152987480164
Epoch	70	MSE:	0.03210574761033058
Epoch	71	MSE:	0.03165265917778015
Epoch	72	MSE:	0.031138190999627113
Epoch	73	MSE:	0.030552007257938385
Epoch	74	MSE:	0.029881874099373817
Epoch	75	MSE:	0.02911338210105896
Epoch	76	MSE:	0.028229745104908943
Epoch	77	MSE:	0.027211803942918777
Epoch	78	MSE:	0.026038315147161484
Epoch	79	MSE:	0.02468690648674965
Epoch	80	MSE:	0.023135803639888763
Epoch	81	MSE:	0.02136680856347084
Epoch	82	MSE:	0.0193698201328516
Epoch	83	MSE:	0.017148876562714577
Epoch	84	MSE:	0.014729505404829979
Epoch	85	MSE:	0.012166552245616913
Epoch	86	MSE:	0.009552966803312302
Epoch	87	MSE:	0.007030440028756857
Epoch	88	MSE:	0.004802271258085966

Epoch 89 MSE: 0.0031357314437627792
Epoch 90 MSE: 0.0023097796365618706
Epoch 91 MSE: 0.002448957646265626
Epoch 92 MSE: 0.0033204867504537106
Epoch 93 MSE: 0.0044088102877140045
Epoch 94 MSE: 0.005187137518078089
Epoch 95 MSE: 0.005293034948408604
Epoch 96 MSE: 0.004716341383755207
Epoch 97 MSE: 0.0037752287462353706
Epoch 98 MSE: 0.0028285295702517033
Epoch 99 MSE: 0.0020741221960633993
T-time: 9.331153631210327

=====

Train Score: 1.36 RMSE

=====

Validation Score: 16.67 RMSE

=====

=====

Time Step = 50 | Hidden States = 2 | Num Layers = 2

=====

Epoch 0 MSE: 0.0374700129032135
Epoch 1 MSE: 0.035636018961668015
Epoch 2 MSE: 0.03456078842282295
Epoch 3 MSE: 0.0342121347784996
Epoch 4 MSE: 0.034095849841833115
Epoch 5 MSE: 0.03360501676797867
Epoch 6 MSE: 0.032605238258838654
Epoch 7 MSE: 0.03124971315264702
Epoch 8 MSE: 0.029755575582385063
Epoch 9 MSE: 0.028341135010123253
Epoch 10 MSE: 0.02706003189086914
Epoch 11 MSE: 0.02556374855339527
Epoch 12 MSE: 0.02347387559711933
Epoch 13 MSE: 0.020887890830636024
Epoch 14 MSE: 0.018430909141898155
Epoch 15 MSE: 0.016589932143688202
Epoch 16 MSE: 0.014509572647511959
Epoch 17 MSE: 0.011592104099690914
Epoch 18 MSE: 0.00901746191084385
Epoch 19 MSE: 0.007894869893789291
Epoch 20 MSE: 0.006267156917601824
Epoch 21 MSE: 0.005734356585890055
Epoch 22 MSE: 0.005994143430143595
Epoch 23 MSE: 0.005611819215118885
Epoch 24 MSE: 0.006483857519924641

Epoch	25	MSE:	0.005994000006467104
Epoch	26	MSE:	0.005704986862838268
Epoch	27	MSE:	0.005203791428357363
Epoch	28	MSE:	0.004206954035907984
Epoch	29	MSE:	0.0033789407461881638
Epoch	30	MSE:	0.002876091282814741
Epoch	31	MSE:	0.002442718017846346
Epoch	32	MSE:	0.0020840668585151434
Epoch	33	MSE:	0.0019269302720203996
Epoch	34	MSE:	0.0019582752138376236
Epoch	35	MSE:	0.002069185022264719
Epoch	36	MSE:	0.002164281904697418
Epoch	37	MSE:	0.0022064747754484415
Epoch	38	MSE:	0.0022001229226589203
Epoch	39	MSE:	0.0021492403466254473
Epoch	40	MSE:	0.0020412702579051256
Epoch	41	MSE:	0.0018725128611549735
Epoch	42	MSE:	0.0016766488552093506
Epoch	43	MSE:	0.0015122051117941737
Epoch	44	MSE:	0.001417440944351256
Epoch	45	MSE:	0.001384751871228218
Epoch	46	MSE:	0.0013834858546033502
Epoch	47	MSE:	0.0013969378778710961
Epoch	48	MSE:	0.0014217628631740808
Epoch	49	MSE:	0.0014384770765900612
Epoch	50	MSE:	0.0014137240359559655
Epoch	51	MSE:	0.001341594266705215
Epoch	52	MSE:	0.001252122106961906
Epoch	53	MSE:	0.001170194591395557
Epoch	54	MSE:	0.001096745952963829
Epoch	55	MSE:	0.0010339501313865185
Epoch	56	MSE:	0.0009962789481505752
Epoch	57	MSE:	0.0009863509330898523
Epoch	58	MSE:	0.0009847191395238042
Epoch	59	MSE:	0.0009750258759595454
Epoch	60	MSE:	0.0009586772648617625
Epoch	61	MSE:	0.0009374641813337803
Epoch	62	MSE:	0.0009047389612533152
Epoch	63	MSE:	0.0008620447479188442
Epoch	64	MSE:	0.0008231191895902157
Epoch	65	MSE:	0.0007940633222460747
Epoch	66	MSE:	0.0007700684363953769
Epoch	67	MSE:	0.000752618012484163
Epoch	68	MSE:	0.000745066674426198
Epoch	69	MSE:	0.0007389666279777884
Epoch	70	MSE:	0.0007276950054802
Epoch	71	MSE:	0.000714835012331605
Epoch	72	MSE:	0.0006990848924033344

```

Epoch 73 MSE: 0.0006777335656806827
Epoch 74 MSE: 0.0006571949925273657
Epoch 75 MSE: 0.0006402835133485496
Epoch 76 MSE: 0.0006243998650461435
Epoch 77 MSE: 0.00061206822283566
Epoch 78 MSE: 0.000603445980232209
Epoch 79 MSE: 0.0005938744288869202
Epoch 80 MSE: 0.000583516142796725
Epoch 81 MSE: 0.0005727694369852543
Epoch 82 MSE: 0.0005592731176875532
Epoch 83 MSE: 0.0005449820891954005
Epoch 84 MSE: 0.0005318266921676695
Epoch 85 MSE: 0.0005188162322156131
Epoch 86 MSE: 0.0005075685912743211
Epoch 87 MSE: 0.0004982661921530962
Epoch 88 MSE: 0.0004889235715381801
Epoch 89 MSE: 0.00048009949387051165
Epoch 90 MSE: 0.00047096985508687794
Epoch 91 MSE: 0.00046066983486525714
Epoch 92 MSE: 0.0004505457472987473
Epoch 93 MSE: 0.00044028344564139843
Epoch 94 MSE: 0.0004303696332499385
Epoch 95 MSE: 0.00042162128374911845
Epoch 96 MSE: 0.00041320189484395087
Epoch 97 MSE: 0.0004053777956869453
Epoch 98 MSE: 0.0003977388550993055
Epoch 99 MSE: 0.0003896840789820999
T-time: 15.219264030456543

```

```

=====
Train Score: 0.59 RMSE
=====
Validation Score: 13.21 RMSE
=====

```

```

=====
Time Step = 50 | Hidden States = 4 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.047699227929115295
Epoch 1 MSE: 0.0403577946126461
Epoch 2 MSE: 0.03543386235833168
Epoch 3 MSE: 0.0323510505259037
Epoch 4 MSE: 0.030534114688634872
Epoch 5 MSE: 0.02939521335065365
Epoch 6 MSE: 0.028316548094153404
Epoch 7 MSE: 0.02683001011610031
Epoch 8 MSE: 0.024718645960092545

```

Epoch 9 MSE: 0.021981289610266685
Epoch 10 MSE: 0.018770406022667885
Epoch 11 MSE: 0.015350286848843098
Epoch 12 MSE: 0.012064987793564796
Epoch 13 MSE: 0.009276753291487694
Epoch 14 MSE: 0.007230101153254509
Epoch 15 MSE: 0.005843719933182001
Epoch 16 MSE: 0.004685766529291868
Epoch 17 MSE: 0.003446610178798437
Epoch 18 MSE: 0.0023557357490062714
Epoch 19 MSE: 0.0019882600754499435
Epoch 20 MSE: 0.002656686119735241
Epoch 21 MSE: 0.0039013498462736607
Epoch 22 MSE: 0.004817979875952005
Epoch 23 MSE: 0.004910567309707403
Epoch 24 MSE: 0.004311470780521631
Epoch 25 MSE: 0.0034501031041145325
Epoch 26 MSE: 0.0027057016268372536
Epoch 27 MSE: 0.002224933821707964
Epoch 28 MSE: 0.00193732266779989
Epoch 29 MSE: 0.0017132823122665286
Epoch 30 MSE: 0.0014996333047747612
Epoch 31 MSE: 0.0013276210520416498
Epoch 32 MSE: 0.0012483777245506644
Epoch 33 MSE: 0.0012804073048755527
Epoch 34 MSE: 0.0013961991062387824
Epoch 35 MSE: 0.001537673408165574
Epoch 36 MSE: 0.0016427887603640556
Epoch 37 MSE: 0.0016688858158886433
Epoch 38 MSE: 0.001604556804522872
Epoch 39 MSE: 0.0014683620538562536
Epoch 40 MSE: 0.0012975090648978949
Epoch 41 MSE: 0.0011319806799292564
Epoch 42 MSE: 0.001000057440251112
Epoch 43 MSE: 0.0009105589706450701
Epoch 44 MSE: 0.0008548147161491215
Epoch 45 MSE: 0.0008169591310434043
Epoch 46 MSE: 0.0007861144258640707
Epoch 47 MSE: 0.0007623882265761495
Epoch 48 MSE: 0.0007529360009357333
Epoch 49 MSE: 0.0007619571988470852
Epoch 50 MSE: 0.0007830730173736811
Epoch 51 MSE: 0.0008003425900824368
Epoch 52 MSE: 0.0007971310988068581
Epoch 53 MSE: 0.0007661162526346743
Epoch 54 MSE: 0.0007133962935768068
Epoch 55 MSE: 0.0006544270436279476
Epoch 56 MSE: 0.0006051636883057654

Epoch 57 MSE: 0.0005742881330661476
Epoch 58 MSE: 0.0005608081701211631
Epoch 59 MSE: 0.0005573479575105011
Epoch 60 MSE: 0.0005559190758503973
Epoch 61 MSE: 0.0005521267303265631
Epoch 62 MSE: 0.0005457376828417182
Epoch 63 MSE: 0.0005383959505707026
Epoch 64 MSE: 0.0005308915278874338
Epoch 65 MSE: 0.0005220581660978496
Epoch 66 MSE: 0.0005097832181490958
Epoch 67 MSE: 0.0004930439754389226
Epoch 68 MSE: 0.0004732786910608411
Epoch 69 MSE: 0.00045401195529848337
Epoch 70 MSE: 0.000438940420281142
Epoch 71 MSE: 0.00042979035060852766
Epoch 72 MSE: 0.0004254326631780714
Epoch 73 MSE: 0.00042283631046302617
Epoch 74 MSE: 0.00041909157880581915
Epoch 75 MSE: 0.0004129809094592929
Epoch 76 MSE: 0.00040506725781597197
Epoch 77 MSE: 0.0003965538926422596
Epoch 78 MSE: 0.0003880947479046881
Epoch 79 MSE: 0.0003795314987655729
Epoch 80 MSE: 0.0003705378039740026
Epoch 81 MSE: 0.00036135411937721074
Epoch 82 MSE: 0.0003528547240421176
Epoch 83 MSE: 0.00034591020084917545
Epoch 84 MSE: 0.0003406602772884071
Epoch 85 MSE: 0.0003363509604241699
Epoch 86 MSE: 0.0003318586095701903
Epoch 87 MSE: 0.00032643985468894243
Epoch 88 MSE: 0.00032011119765229523
Epoch 89 MSE: 0.00031343201408162713
Epoch 90 MSE: 0.00030697256443090737
Epoch 91 MSE: 0.00030094769317656755
Epoch 92 MSE: 0.00029525786521844566
Epoch 93 MSE: 0.00028978486079722643
Epoch 94 MSE: 0.000284588779322803
Epoch 95 MSE: 0.00027982122264802456
Epoch 96 MSE: 0.0002754808811005205
Epoch 97 MSE: 0.00027130290982313454
Epoch 98 MSE: 0.00026692109531722963
Epoch 99 MSE: 0.000262151297647506
T-time: 12.319850444793701

=====
Train Score: 0.48 RMSE
=====

Validation Score: 10.03 RMSE

=====

=====

Time Step = 50 | Hidden States = 4 | Num Layers = 2

=====

Epoch	0	MSE:	0.33187252283096313
Epoch	1	MSE:	0.28996092081069946
Epoch	2	MSE:	0.25252556800842285
Epoch	3	MSE:	0.21925488114356995
Epoch	4	MSE:	0.18956483900547028
Epoch	5	MSE:	0.1628427505493164
Epoch	6	MSE:	0.13853462040424347
Epoch	7	MSE:	0.1162320002913475
Epoch	8	MSE:	0.09571653604507446
Epoch	9	MSE:	0.07700160145759583
Epoch	10	MSE:	0.060377754271030426
Epoch	11	MSE:	0.04643342271447182
Epoch	12	MSE:	0.03601546585559845
Epoch	13	MSE:	0.03007112443447113
Epoch	14	MSE:	0.02924986556172371
Epoch	15	MSE:	0.03310723602771759
Epoch	16	MSE:	0.039304859936237335
Epoch	17	MSE:	0.0445881150662899
Epoch	18	MSE:	0.04700835794210434
Epoch	19	MSE:	0.046427492052316666
Epoch	20	MSE:	0.04371706396341324
Epoch	21	MSE:	0.04000725969672203
Epoch	22	MSE:	0.0362674854695797
Epoch	23	MSE:	0.0331343375146389
Epoch	24	MSE:	0.030897734686732292
Epoch	25	MSE:	0.029576284810900688
Epoch	26	MSE:	0.029022306203842163
Epoch	27	MSE:	0.029015829786658287
Epoch	28	MSE:	0.029329683631658554
Epoch	29	MSE:	0.02976566180586815
Epoch	30	MSE:	0.030169591307640076
Epoch	31	MSE:	0.030433764681220055
Epoch	32	MSE:	0.030493076890707016
Epoch	33	MSE:	0.030318740755319595
Epoch	34	MSE:	0.029911397024989128
Epoch	35	MSE:	0.02929447963833809
Epoch	36	MSE:	0.028508035466074944
Epoch	37	MSE:	0.02760288119316101
Epoch	38	MSE:	0.026634905487298965
Epoch	39	MSE:	0.025659242644906044
Epoch	40	MSE:	0.02472436986863613

Epoch	41	MSE:	0.02386610023677349
Epoch	42	MSE:	0.02310207672417164
Epoch	43	MSE:	0.022427696734666824
Epoch	44	MSE:	0.02181483805179596
Epoch	45	MSE:	0.02121479995548725
Epoch	46	MSE:	0.020566359162330627
Epoch	47	MSE:	0.019808275625109673
Epoch	48	MSE:	0.018893908709287643
Epoch	49	MSE:	0.01780346967279911
Epoch	50	MSE:	0.016549719497561455
Epoch	51	MSE:	0.015174604021012783
Epoch	52	MSE:	0.013737772591412067
Epoch	53	MSE:	0.012300800532102585
Epoch	54	MSE:	0.010912704281508923
Epoch	55	MSE:	0.009601225145161152
Epoch	56	MSE:	0.008372189477086067
Epoch	57	MSE:	0.007216496858745813
Epoch	58	MSE:	0.006122284103184938
Epoch	59	MSE:	0.005088508129119873
Epoch	60	MSE:	0.00413524080067873
Epoch	61	MSE:	0.0033058577682822943
Epoch	62	MSE:	0.0026580553967505693
Epoch	63	MSE:	0.002244590548798442
Epoch	64	MSE:	0.002089456422254443
Epoch	65	MSE:	0.0021686239633709192
Epoch	66	MSE:	0.0024054262321442366
Epoch	67	MSE:	0.0026894640177488327
Epoch	68	MSE:	0.002916505793109536
Epoch	69	MSE:	0.0030248723924160004
Epoch	70	MSE:	0.0030026810709387064
Epoch	71	MSE:	0.0028699280228465796
Epoch	72	MSE:	0.0026579583063721657
Epoch	73	MSE:	0.0023988094180822372
Epoch	74	MSE:	0.0021226005628705025
Epoch	75	MSE:	0.0018561258912086487
Epoch	76	MSE:	0.001620094757527113
Epoch	77	MSE:	0.001427411218173802
Epoch	78	MSE:	0.0012837734539061785
Epoch	79	MSE:	0.001189259928651154
Epoch	80	MSE:	0.0011395749170333147
Epoch	81	MSE:	0.0011268112575635314
Epoch	82	MSE:	0.0011402784148231149
Epoch	83	MSE:	0.0011678457958623767
Epoch	84	MSE:	0.0011977722169831395
Epoch	85	MSE:	0.0012205514358356595
Epoch	86	MSE:	0.0012301786337047815
Epoch	87	MSE:	0.0012244347017258406
Epoch	88	MSE:	0.0012042165035381913

```

Epoch 89 MSE: 0.0011723109055310488
Epoch 90 MSE: 0.0011321547208353877
Epoch 91 MSE: 0.0010870136320590973
Epoch 92 MSE: 0.0010397210717201233
Epoch 93 MSE: 0.0009928109357133508
Epoch 94 MSE: 0.0009487365023232996
Epoch 95 MSE: 0.0009098851005546749
Epoch 96 MSE: 0.0008782932418398559
Epoch 97 MSE: 0.0008551795035600662
Epoch 98 MSE: 0.0008405499975197017
Epoch 99 MSE: 0.0008331199060194194
T-time: 21.50165367126465

```

```
=====
```

```
Train Score: 0.86 RMSE
```

```
=====
```

```
Validation Score: 15.13 RMSE
```

```
=====
```

```
=====
```

```
Time Step = 50 | Hidden States = 8 | Num Layers = 1
```

```
=====
```

```

Epoch 0 MSE: 0.058424100279808044
Epoch 1 MSE: 0.04329431429505348
Epoch 2 MSE: 0.033064231276512146
Epoch 3 MSE: 0.027678778395056725
Epoch 4 MSE: 0.026682056486606598
Epoch 5 MSE: 0.02852580137550831
Epoch 6 MSE: 0.03046368435025215
Epoch 7 MSE: 0.03070507012307644
Epoch 8 MSE: 0.029239682480692863
Epoch 9 MSE: 0.02684829942882061
Epoch 10 MSE: 0.024330683052539825
Epoch 11 MSE: 0.02221529744565487
Epoch 12 MSE: 0.020714357495307922
Epoch 13 MSE: 0.01978319138288498
Epoch 14 MSE: 0.01921330951154232
Epoch 15 MSE: 0.01872563362121582
Epoch 16 MSE: 0.018050063401460648
Epoch 17 MSE: 0.016985759139060974
Epoch 18 MSE: 0.015439293347299099
Epoch 19 MSE: 0.013439802452921867
Epoch 20 MSE: 0.011132773011922836
Epoch 21 MSE: 0.008754229173064232
Epoch 22 MSE: 0.0065818182192742825
Epoch 23 MSE: 0.004850185476243496
Epoch 24 MSE: 0.0036259121261537075

```

Epoch	25	MSE:	0.0027268456760793924
Epoch	26	MSE:	0.0019086222164332867
Epoch	27	MSE:	0.0012554904678836465
Epoch	28	MSE:	0.0011920296819880605
Epoch	29	MSE:	0.0019867578521370888
Epoch	30	MSE:	0.0031046196818351746
Epoch	31	MSE:	0.0035410772543400526
Epoch	32	MSE:	0.002916240831837058
Epoch	33	MSE:	0.0016865157522261143
Epoch	34	MSE:	0.0006008659256622195
Epoch	35	MSE:	0.0001670877099968493
Epoch	36	MSE:	0.0003845070314127952
Epoch	37	MSE:	0.0008423026883974671
Epoch	38	MSE:	0.0011152394581586123
Epoch	39	MSE:	0.0010800636373460293
Epoch	40	MSE:	0.0008864811388775706
Epoch	41	MSE:	0.000736396701540798
Epoch	42	MSE:	0.0007210024632513523
Epoch	43	MSE:	0.0007955388864502311
Epoch	44	MSE:	0.000846494163852185
Epoch	45	MSE:	0.0007804576889611781
Epoch	46	MSE:	0.0005841376259922981
Epoch	47	MSE:	0.000332698633428663
Epoch	48	MSE:	0.00014600876602344215
Epoch	49	MSE:	0.00011173709208378568
Epoch	50	MSE:	0.00021754682529717684
Epoch	51	MSE:	0.0003522115875966847
Epoch	52	MSE:	0.00039872725028544664
Epoch	53	MSE:	0.00033821017132140696
Epoch	54	MSE:	0.00024858381948433816
Epoch	55	MSE:	0.00020865142869297415
Epoch	56	MSE:	0.00022544532839674503
Epoch	57	MSE:	0.00024867671891115606
Epoch	58	MSE:	0.00023224939650390297
Epoch	59	MSE:	0.0001753529504640028
Epoch	60	MSE:	0.0001159582388936542
Epoch	61	MSE:	9.398382826475427e-05
Epoch	62	MSE:	0.00011814806930487975
Epoch	63	MSE:	0.00016158765356522053
Epoch	64	MSE:	0.0001868795952759683
Epoch	65	MSE:	0.00017680057499092072
Epoch	66	MSE:	0.0001440385967725888
Epoch	67	MSE:	0.0001148698793258518
Epoch	68	MSE:	0.00010543044481892139
Epoch	69	MSE:	0.00011156315304106101
Epoch	70	MSE:	0.00011737544264178723
Epoch	71	MSE:	0.00011160735448356718
Epoch	72	MSE:	9.701968519948423e-05

```

Epoch 73 MSE: 8.603122114436701e-05
Epoch 74 MSE: 8.782828808762133e-05
Epoch 75 MSE: 9.9282777227927e-05
Epoch 76 MSE: 0.00010829667735379189
Epoch 77 MSE: 0.00010584817209746689
Epoch 78 MSE: 9.40537138376385e-05
Epoch 79 MSE: 8.256221190094948e-05
Epoch 80 MSE: 7.859499601181597e-05
Epoch 81 MSE: 8.133298251777887e-05
Epoch 82 MSE: 8.477984374621883e-05
Epoch 83 MSE: 8.441498357569799e-05
Epoch 84 MSE: 8.082251588348299e-05
Epoch 85 MSE: 7.783895125612617e-05
Epoch 86 MSE: 7.8062221291475e-05
Epoch 87 MSE: 8.034038910409436e-05
Epoch 88 MSE: 8.132613584166393e-05
Epoch 89 MSE: 7.906816608738154e-05
Epoch 90 MSE: 7.485458627343178e-05
Epoch 91 MSE: 7.16753420419991e-05
Epoch 92 MSE: 7.123666000552475e-05
Epoch 93 MSE: 7.262633153004572e-05
Epoch 94 MSE: 7.364207704085857e-05
Epoch 95 MSE: 7.306024781428277e-05
Epoch 96 MSE: 7.151623140089214e-05
Epoch 97 MSE: 7.040942728053778e-05
Epoch 98 MSE: 7.027840183582157e-05
Epoch 99 MSE: 7.039428601274267e-05
T-time: 10.873689413070679

```

```

=====
Train Score: 0.25 RMSE
=====
Validation Score: 5.84 RMSE
=====

```

```

=====
Time Step = 50 | Hidden States = 8 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.1302509605884552
Epoch 1 MSE: 0.09970978647470474
Epoch 2 MSE: 0.07591716945171356
Epoch 3 MSE: 0.05807344242930412
Epoch 4 MSE: 0.04556714743375778
Epoch 5 MSE: 0.0380430594086647
Epoch 6 MSE: 0.035237036645412445
Epoch 7 MSE: 0.036477115005254745
Epoch 8 MSE: 0.03990400955080986

```

Epoch 9 MSE: 0.042836952954530716
Epoch 10 MSE: 0.043728332966566086
Epoch 11 MSE: 0.04262995347380638
Epoch 12 MSE: 0.04034360498189926
Epoch 13 MSE: 0.03773856908082962
Epoch 14 MSE: 0.03544874116778374
Epoch 15 MSE: 0.03379964828491211
Epoch 16 MSE: 0.03285196051001549
Epoch 17 MSE: 0.03248804807662964
Epoch 18 MSE: 0.032496653497219086
Epoch 19 MSE: 0.03263560310006142
Epoch 20 MSE: 0.03267347812652588
Epoch 21 MSE: 0.03241885080933571
Epoch 22 MSE: 0.031737178564071655
Epoch 23 MSE: 0.03055131807923317
Epoch 24 MSE: 0.02882988750934601
Epoch 25 MSE: 0.026577472686767578
Epoch 26 MSE: 0.023847924545407295
Epoch 27 MSE: 0.02079167403280735
Epoch 28 MSE: 0.01770988292992115
Epoch 29 MSE: 0.014939893037080765
Epoch 30 MSE: 0.012350838631391525
Epoch 31 MSE: 0.009291018359363079
Epoch 32 MSE: 0.0059777116402983665
Epoch 33 MSE: 0.00443768547847867
Epoch 34 MSE: 0.005606395658105612
Epoch 35 MSE: 0.007542717270553112
Epoch 36 MSE: 0.007951632142066956
Epoch 37 MSE: 0.007135819178074598
Epoch 38 MSE: 0.005597361829131842
Epoch 39 MSE: 0.004608544055372477
Epoch 40 MSE: 0.003936560358852148
Epoch 41 MSE: 0.003633882850408554
Epoch 42 MSE: 0.0035270629450678825
Epoch 43 MSE: 0.0033467255998402834
Epoch 44 MSE: 0.0032698484137654305
Epoch 45 MSE: 0.003345335368067026
Epoch 46 MSE: 0.003491020994260907
Epoch 47 MSE: 0.003601304953917861
Epoch 48 MSE: 0.0035669179633259773
Epoch 49 MSE: 0.0033383548725396395
Epoch 50 MSE: 0.00294800428673625
Epoch 51 MSE: 0.0024944536853581667
Epoch 52 MSE: 0.0021047794725745916
Epoch 53 MSE: 0.0018792720511555672
Epoch 54 MSE: 0.0018367223674431443
Epoch 55 MSE: 0.001901602023281157
Epoch 56 MSE: 0.0019465495133772492

Epoch 57 MSE: 0.0018815959338098764
Epoch 58 MSE: 0.0017107551684603095
Epoch 59 MSE: 0.0015026973560452461
Epoch 60 MSE: 0.0013226866722106934
Epoch 61 MSE: 0.0011943303979933262
Epoch 62 MSE: 0.0011082314886152744
Epoch 63 MSE: 0.0010491559514775872
Epoch 64 MSE: 0.001010664738714695
Epoch 65 MSE: 0.0009902295423671603
Epoch 66 MSE: 0.0009777839295566082
Epoch 67 MSE: 0.0009537209407426417
Epoch 68 MSE: 0.0009011283982545137
Epoch 69 MSE: 0.0008213697001338005
Epoch 70 MSE: 0.000736365735065192
Epoch 71 MSE: 0.000672969501465559
Epoch 72 MSE: 0.0006427824264392257
Epoch 73 MSE: 0.0006350618787109852
Epoch 74 MSE: 0.000627503206487745
Epoch 75 MSE: 0.0006039714789949358
Epoch 76 MSE: 0.0005641220486722887
Epoch 77 MSE: 0.0005188637296669185
Epoch 78 MSE: 0.0004783199692610651
Epoch 79 MSE: 0.000444484525360167
Epoch 80 MSE: 0.00041437186882831156
Epoch 81 MSE: 0.00038732821121811867
Epoch 82 MSE: 0.00036622246261686087
Epoch 83 MSE: 0.0003516400174703449
Epoch 84 MSE: 0.0003380428534001112
Epoch 85 MSE: 0.00031805530306883156
Epoch 86 MSE: 0.0002903818094637245
Epoch 87 MSE: 0.00026206386974081397
Epoch 88 MSE: 0.00024185270012822002
Epoch 89 MSE: 0.00023145404702518135
Epoch 90 MSE: 0.00022439785243477672
Epoch 91 MSE: 0.00021371310867834836
Epoch 92 MSE: 0.00019877530576195568
Epoch 93 MSE: 0.00018348291632719338
Epoch 94 MSE: 0.00017015618504956365
Epoch 95 MSE: 0.00015805869770701975
Epoch 96 MSE: 0.00014684362395200878
Epoch 97 MSE: 0.00013795019185636193
Epoch 98 MSE: 0.00013148356811143458
Epoch 99 MSE: 0.00012434954987838864
T-time: 21.277970790863037

=====
Train Score: 0.33 RMSE
=====

Validation Score: 12.09 RMSE

=====

=====

Time Step = 50 | Hidden States = 16 | Num Layers = 1

=====

Epoch	0	MSE:	0.03285951912403107
Epoch	1	MSE:	0.03075476549565792
Epoch	2	MSE:	0.02826731838285923
Epoch	3	MSE:	0.026006106287240982
Epoch	4	MSE:	0.02310761623084545
Epoch	5	MSE:	0.020261136814951897
Epoch	6	MSE:	0.01646673120558262
Epoch	7	MSE:	0.011825131252408028
Epoch	8	MSE:	0.006906010210514069
Epoch	9	MSE:	0.0016963323578238487
Epoch	10	MSE:	0.0012760853860527277
Epoch	11	MSE:	0.00948462262749672
Epoch	12	MSE:	0.005685037933290005
Epoch	13	MSE:	0.0034057290758937597
Epoch	14	MSE:	0.00034108763793483377
Epoch	15	MSE:	0.0005842677201144397
Epoch	16	MSE:	0.0015792474150657654
Epoch	17	MSE:	0.0018052472732961178
Epoch	18	MSE:	0.0020006918348371983
Epoch	19	MSE:	0.002487612422555685
Epoch	20	MSE:	0.0027224007062613964
Epoch	21	MSE:	0.002370781498029828
Epoch	22	MSE:	0.0017896348144859076
Epoch	23	MSE:	0.0014007420977577567
Epoch	24	MSE:	0.001126701943576336
Epoch	25	MSE:	0.0006815172964707017
Epoch	26	MSE:	0.0002007434522965923
Epoch	27	MSE:	0.00011182519665453583
Epoch	28	MSE:	0.0003617595648393035
Epoch	29	MSE:	0.0005002116085961461
Epoch	30	MSE:	0.0005865277489647269
Epoch	31	MSE:	0.0008008908480405807
Epoch	32	MSE:	0.0008070911862887442
Epoch	33	MSE:	0.0005263633211143315
Epoch	34	MSE:	0.000316180638037622
Epoch	35	MSE:	0.0002359907957725227
Epoch	36	MSE:	0.00013046414824202657
Epoch	37	MSE:	6.694182229693979e-05
Epoch	38	MSE:	0.00013862131163477898
Epoch	39	MSE:	0.000245537084992975
Epoch	40	MSE:	0.0002798286732286215

Epoch	41	MSE:	0.00027530008810572326
Epoch	42	MSE:	0.00028733391081914306
Epoch	43	MSE:	0.000279270694591105
Epoch	44	MSE:	0.00020983406284358352
Epoch	45	MSE:	0.0001281245640711859
Epoch	46	MSE:	9.245367982657626e-05
Epoch	47	MSE:	8.051433542277664e-05
Epoch	48	MSE:	6.1412101786118e-05
Epoch	49	MSE:	6.619438499910757e-05
Epoch	50	MSE:	0.0001072640807251446
Epoch	51	MSE:	0.00013296958059072495
Epoch	52	MSE:	0.00012485070328693837
Epoch	53	MSE:	0.00011626279592746869
Epoch	54	MSE:	0.000106322746432852
Epoch	55	MSE:	7.698859553784132e-05
Epoch	56	MSE:	5.086490273242816e-05
Epoch	57	MSE:	4.889835690846667e-05
Epoch	58	MSE:	5.412191603682004e-05
Epoch	59	MSE:	5.5292563047260046e-05
Epoch	60	MSE:	6.307630246737972e-05
Epoch	61	MSE:	7.464266673196107e-05
Epoch	62	MSE:	7.475032907677814e-05
Epoch	63	MSE:	6.580259650945663e-05
Epoch	64	MSE:	5.957728353678249e-05
Epoch	65	MSE:	5.387235069065355e-05
Epoch	66	MSE:	4.46718986495398e-05
Epoch	67	MSE:	4.027943577966653e-05
Epoch	68	MSE:	4.393967174110003e-05
Epoch	69	MSE:	4.726933184429072e-05
Epoch	70	MSE:	4.841410191147588e-05
Epoch	71	MSE:	5.1254068239359185e-05
Epoch	72	MSE:	5.195894482312724e-05
Epoch	73	MSE:	4.760604497278109e-05
Epoch	74	MSE:	4.361172250355594e-05
Epoch	75	MSE:	4.198585884296335e-05
Epoch	76	MSE:	3.9968228520592675e-05
Epoch	77	MSE:	3.9096325053833425e-05
Epoch	78	MSE:	4.1098166548181325e-05
Epoch	79	MSE:	4.280464781913906e-05
Epoch	80	MSE:	4.276079198461957e-05
Epoch	81	MSE:	4.2798677895916626e-05
Epoch	82	MSE:	4.238582550897263e-05
Epoch	83	MSE:	4.0459144656779245e-05
Epoch	84	MSE:	3.891009328071959e-05
Epoch	85	MSE:	3.867215491482057e-05
Epoch	86	MSE:	3.846829349640757e-05
Epoch	87	MSE:	3.852800728054717e-05
Epoch	88	MSE:	3.939838643418625e-05

```

Epoch 89 MSE: 3.97976218664553e-05
Epoch 90 MSE: 3.937021756428294e-05
Epoch 91 MSE: 3.903059405274689e-05
Epoch 92 MSE: 3.8551606849068776e-05
Epoch 93 MSE: 3.777026722673327e-05
Epoch 94 MSE: 3.750300675164908e-05
Epoch 95 MSE: 3.7669597077183425e-05
Epoch 96 MSE: 3.770220428123139e-05
Epoch 97 MSE: 3.783533611567691e-05
Epoch 98 MSE: 3.802502396865748e-05
Epoch 99 MSE: 3.782587009482086e-05
T-time: 19.1439528465271

```

```

=====
Train Score: 0.18 RMSE
=====
Validation Score: 5.01 RMSE
=====

```

```

=====
Time Step = 50 | Hidden States = 16 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.055803071707487106
Epoch 1 MSE: 0.04059523716568947
Epoch 2 MSE: 0.03624124825000763
Epoch 3 MSE: 0.03919117897748947
Epoch 4 MSE: 0.0380801260471344
Epoch 5 MSE: 0.03565781190991402
Epoch 6 MSE: 0.034267254173755646
Epoch 7 MSE: 0.03381923958659172
Epoch 8 MSE: 0.03372098505496979
Epoch 9 MSE: 0.033516764640808105
Epoch 10 MSE: 0.032939642667770386
Epoch 11 MSE: 0.031853482127189636
Epoch 12 MSE: 0.030194642022252083
Epoch 13 MSE: 0.027944287285208702
Epoch 14 MSE: 0.025148732587695122
Epoch 15 MSE: 0.02187371999025345
Epoch 16 MSE: 0.017800379544496536
Epoch 17 MSE: 0.011946016922593117
Epoch 18 MSE: 0.004980036057531834
Epoch 19 MSE: 0.001874722307547927
Epoch 20 MSE: 0.0050443727523088455
Epoch 21 MSE: 0.008630452677607536
Epoch 22 MSE: 0.00877425353974104
Epoch 23 MSE: 0.006138664670288563
Epoch 24 MSE: 0.003178745973855257

```

Epoch 25 MSE: 0.00162295822519809
 Epoch 26 MSE: 0.0015493737300857902
 Epoch 27 MSE: 0.002158679300919175
 Epoch 28 MSE: 0.002810870064422488
 Epoch 29 MSE: 0.003262718440964818
 Epoch 30 MSE: 0.0033794716000556946
 Epoch 31 MSE: 0.0030550009105354548
 Epoch 32 MSE: 0.0023591765202581882
 Epoch 33 MSE: 0.0015965043567121029
 Epoch 34 MSE: 0.0011583867017179728
 Epoch 35 MSE: 0.0011432109167799354
 Epoch 36 MSE: 0.0012348229065537453
 Epoch 37 MSE: 0.0013243977446109056
 Epoch 38 MSE: 0.0015509017976000905
 Epoch 39 MSE: 0.0017215160187333822
 Epoch 40 MSE: 0.0015660750214010477
 Epoch 41 MSE: 0.0012093037366867065
 Epoch 42 MSE: 0.0009430420468561351
 Epoch 43 MSE: 0.0007874839939177036
 Epoch 44 MSE: 0.0006541757611557841
 Epoch 45 MSE: 0.0006325896247290075
 Epoch 46 MSE: 0.0007552306051366031
 Epoch 47 MSE: 0.0008674318669363856
 Epoch 48 MSE: 0.0008464900311082602
 Epoch 49 MSE: 0.0007269553607329726
 Epoch 50 MSE: 0.0005913266213610768
 Epoch 51 MSE: 0.00045657847658731043
 Epoch 52 MSE: 0.0003421059809625149
 Epoch 53 MSE: 0.00032040776568464935
 Epoch 54 MSE: 0.00037921854527667165
 Epoch 55 MSE: 0.0004142190737184137
 Epoch 56 MSE: 0.0003898038703482598
 Epoch 57 MSE: 0.00032969089807011187
 Epoch 58 MSE: 0.00023430748842656612
 Epoch 59 MSE: 0.00015588382666464895
 Epoch 60 MSE: 0.00015040092694107443
 Epoch 61 MSE: 0.00018307840218767524
 Epoch 62 MSE: 0.00020863320969510823
 Epoch 63 MSE: 0.00020313699496909976
 Epoch 64 MSE: 0.0001514190371381119
 Epoch 65 MSE: 9.284142288379371e-05
 Epoch 66 MSE: 7.53811837057583e-05
 Epoch 67 MSE: 9.183634392684326e-05
 Epoch 68 MSE: 0.00011768362310249358
 Epoch 69 MSE: 0.00011743413051590323
 Epoch 70 MSE: 8.590637298766524e-05
 Epoch 71 MSE: 5.749673073296435e-05
 Epoch 72 MSE: 5.113667430123314e-05

```

Epoch 73 MSE: 7.103079406078905e-05
Epoch 74 MSE: 8.471649925922975e-05
Epoch 75 MSE: 7.427162199746817e-05
Epoch 76 MSE: 5.429471275419928e-05
Epoch 77 MSE: 4.440270276973024e-05
Epoch 78 MSE: 5.614446854451671e-05
Epoch 79 MSE: 6.575937732122838e-05
Epoch 80 MSE: 6.40798025415279e-05
Epoch 81 MSE: 5.059872637502849e-05
Epoch 82 MSE: 4.4118980440543965e-05
Epoch 83 MSE: 4.964014806319028e-05
Epoch 84 MSE: 5.620254160021432e-05
Epoch 85 MSE: 5.5105541832745075e-05
Epoch 86 MSE: 4.583523332257755e-05
Epoch 87 MSE: 4.287223782739602e-05
Epoch 88 MSE: 4.543570685200393e-05
Epoch 89 MSE: 4.9855098041007295e-05
Epoch 90 MSE: 4.729110878542997e-05
Epoch 91 MSE: 4.239525878801942e-05
Epoch 92 MSE: 4.02678779209964e-05
Epoch 93 MSE: 4.259427441866137e-05
Epoch 94 MSE: 4.459390038391575e-05
Epoch 95 MSE: 4.2485127778491005e-05
Epoch 96 MSE: 3.961606489610858e-05
Epoch 97 MSE: 3.873397872666828e-05
Epoch 98 MSE: 4.070414797752164e-05
Epoch 99 MSE: 4.1201830754289404e-05
T-time: 45.053837299346924

```

```

=====
Train Score: 0.19 RMSE
=====
Validation Score: 4.53 RMSE
=====

```

```

=====
Time Step = 50 | Hidden States = 32 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.054831381887197495
Epoch 1 MSE: 0.03660176694393158
Epoch 2 MSE: 0.032372523099184036
Epoch 3 MSE: 0.034817032516002655
Epoch 4 MSE: 0.032896529883146286
Epoch 5 MSE: 0.02835434302687645
Epoch 6 MSE: 0.024636749178171158
Epoch 7 MSE: 0.022329257801175117
Epoch 8 MSE: 0.02039140649139881

```

Epoch 9 MSE: 0.017229245975613594
Epoch 10 MSE: 0.011185265146195889
Epoch 11 MSE: 0.0027695035096257925
Epoch 12 MSE: 0.023742202669382095
Epoch 13 MSE: 0.002632385352626443
Epoch 14 MSE: 0.0030763025861233473
Epoch 15 MSE: 0.00814159493893385
Epoch 16 MSE: 0.010175475850701332
Epoch 17 MSE: 0.009152109734714031
Epoch 18 MSE: 0.006416885647922754
Epoch 19 MSE: 0.003540203906595707
Epoch 20 MSE: 0.0020009500440210104
Epoch 21 MSE: 0.0025878127198666334
Epoch 22 MSE: 0.00435244757682085
Epoch 23 MSE: 0.004914658144116402
Epoch 24 MSE: 0.003362047951668501
Epoch 25 MSE: 0.0012448944617062807
Epoch 26 MSE: 0.0002544672170188278
Epoch 27 MSE: 0.0006865999312140048
Epoch 28 MSE: 0.0017446683486923575
Epoch 29 MSE: 0.002436249516904354
Epoch 30 MSE: 0.002275325357913971
Epoch 31 MSE: 0.0014789963606745005
Epoch 32 MSE: 0.0006731877219863236
Epoch 33 MSE: 0.00039057445246726274
Epoch 34 MSE: 0.0006768318708054721
Epoch 35 MSE: 0.001088457414880395
Epoch 36 MSE: 0.0011549743358045816
Epoch 37 MSE: 0.0008373437449336052
Epoch 38 MSE: 0.0004552750615403056
Epoch 39 MSE: 0.0002944599837064743
Epoch 40 MSE: 0.0003942231123801321
Epoch 41 MSE: 0.0006081132451072335
Epoch 42 MSE: 0.0007571107125841081
Epoch 43 MSE: 0.000740201969165355
Epoch 44 MSE: 0.000570731412153691
Epoch 45 MSE: 0.00035157069214619696
Epoch 46 MSE: 0.0002086346794385463
Epoch 47 MSE: 0.0002099591656588018
Epoch 48 MSE: 0.0003165457455907017
Epoch 49 MSE: 0.0004134720948059112
Epoch 50 MSE: 0.00041081238305196166
Epoch 51 MSE: 0.00032002420630306005
Epoch 52 MSE: 0.00022663624258711934
Epoch 53 MSE: 0.0001994183985516429
Epoch 54 MSE: 0.00023606611648574471
Epoch 55 MSE: 0.00028307962929829955
Epoch 56 MSE: 0.00029052834725007415

```

Epoch 57 MSE: 0.00024958403082564473
Epoch 58 MSE: 0.00019139026699122041
Epoch 59 MSE: 0.00015724514378234744
Epoch 60 MSE: 0.0001654002262512222
Epoch 61 MSE: 0.0001988519506994635
Epoch 62 MSE: 0.0002226808137493208
Epoch 63 MSE: 0.00021507339261006564
Epoch 64 MSE: 0.00018364464631304145
Epoch 65 MSE: 0.0001540029188618064
Epoch 66 MSE: 0.00014510267646983266
Epoch 67 MSE: 0.00015524936316069216
Epoch 68 MSE: 0.00016796936688479036
Epoch 69 MSE: 0.00016849118401296437
Epoch 70 MSE: 0.00015558874292764813
Epoch 71 MSE: 0.00014029211888555437
Epoch 72 MSE: 0.0001343795156572014
Epoch 73 MSE: 0.00013950772699899971
Epoch 74 MSE: 0.0001467464171582833
Epoch 75 MSE: 0.00014627815107814968
Epoch 76 MSE: 0.0001369289238937199
Epoch 77 MSE: 0.00012607501412276179
Epoch 78 MSE: 0.00012138515012338758
Epoch 79 MSE: 0.0001237910910276696
Epoch 80 MSE: 0.00012796830560546368
Epoch 81 MSE: 0.00012825288285966963
Epoch 82 MSE: 0.00012363039422780275
Epoch 83 MSE: 0.00011768559488700703
Epoch 84 MSE: 0.00011449571320554242
Epoch 85 MSE: 0.00011476911458885297
Epoch 86 MSE: 0.00011575558892218396
Epoch 87 MSE: 0.0001145353089668788
Epoch 88 MSE: 0.0001110053199226968
Epoch 89 MSE: 0.00010756103438325226
Epoch 90 MSE: 0.00010625612776493654
Epoch 91 MSE: 0.00010673615906853229
Epoch 92 MSE: 0.00010693367948988453
Epoch 93 MSE: 0.0001053813612088561
Epoch 94 MSE: 0.00010257307440042496
Epoch 95 MSE: 0.00010017088789027184
Epoch 96 MSE: 9.917482384480536e-05
Epoch 97 MSE: 9.904593753162771e-05
Epoch 98 MSE: 9.853077062871307e-05
Epoch 99 MSE: 9.70731271081604e-05
T-time: 42.455177307128906

```

```

=====
Train Score: 0.29 RMSE
=====

```

Validation Score: 6.64 RMSE

=====

=====

Time Step = 50 | Hidden States = 32 | Num Layers = 2

=====

Epoch	0	MSE:	0.04075655713677406
Epoch	1	MSE:	0.04284535348415375
Epoch	2	MSE:	0.03628775104880333
Epoch	3	MSE:	0.03300190716981888
Epoch	4	MSE:	0.03260623663663864
Epoch	5	MSE:	0.030995318666100502
Epoch	6	MSE:	0.026288257911801338
Epoch	7	MSE:	0.01941317692399025
Epoch	8	MSE:	0.01401967741549015
Epoch	9	MSE:	0.008915595710277557
Epoch	10	MSE:	0.0010283333249390125
Epoch	11	MSE:	0.009885257109999657
Epoch	12	MSE:	0.006996167823672295
Epoch	13	MSE:	0.0023384871892631054
Epoch	14	MSE:	0.0014383298112079501
Epoch	15	MSE:	0.0016941205831244588
Epoch	16	MSE:	0.003233431838452816
Epoch	17	MSE:	0.0040593575686216354
Epoch	18	MSE:	0.0036329030990600586
Epoch	19	MSE:	0.002303705085068941
Epoch	20	MSE:	0.0010384410852566361
Epoch	21	MSE:	0.000944638391956687
Epoch	22	MSE:	0.001131431432440877
Epoch	23	MSE:	0.0011630028020590544
Epoch	24	MSE:	0.0017636758275330067
Epoch	25	MSE:	0.001896482310257852
Epoch	26	MSE:	0.0012234507594257593
Epoch	27	MSE:	0.000605455890763551
Epoch	28	MSE:	0.0005808566347695887
Epoch	29	MSE:	0.0006536227301694453
Epoch	30	MSE:	0.0006583320209756494
Epoch	31	MSE:	0.0008069886243902147
Epoch	32	MSE:	0.0009560697362758219
Epoch	33	MSE:	0.0008751584682613611
Epoch	34	MSE:	0.0005768679548054934
Epoch	35	MSE:	0.00031856345594860613
Epoch	36	MSE:	0.0003299250965937972
Epoch	37	MSE:	0.0004728894855361432
Epoch	38	MSE:	0.0004995386698283255
Epoch	39	MSE:	0.00048607285134494305
Epoch	40	MSE:	0.0004820390895474702

Epoch	41	MSE:	0.00038917901110835373
Epoch	42	MSE:	0.00024799376842565835
Epoch	43	MSE:	0.00022006651852279902
Epoch	44	MSE:	0.0003166179230902344
Epoch	45	MSE:	0.0003656914923340082
Epoch	46	MSE:	0.00030934519600123167
Epoch	47	MSE:	0.0002524334704503417
Epoch	48	MSE:	0.00023302419867832214
Epoch	49	MSE:	0.00020568695617839694
Epoch	50	MSE:	0.00017770285194274038
Epoch	51	MSE:	0.00020212039817124605
Epoch	52	MSE:	0.0002402968966634944
Epoch	53	MSE:	0.00020895634952466935
Epoch	54	MSE:	0.00015435910609085113
Epoch	55	MSE:	0.00014562375145033002
Epoch	56	MSE:	0.00015625639935024083
Epoch	57	MSE:	0.00015453518426511437
Epoch	58	MSE:	0.00015440127754118294
Epoch	59	MSE:	0.00015799846732988954
Epoch	60	MSE:	0.00014059807290323079
Epoch	61	MSE:	0.00011362275836290792
Epoch	62	MSE:	0.00011234173143748194
Epoch	63	MSE:	0.00012676768528763205
Epoch	64	MSE:	0.00012633661390282214
Epoch	65	MSE:	0.00011498777166707441
Epoch	66	MSE:	0.00010838118760148063
Epoch	67	MSE:	0.00010136724449694157
Epoch	68	MSE:	9.452662197872996e-05
Epoch	69	MSE:	9.791782213142142e-05
Epoch	70	MSE:	0.00010281218419549987
Epoch	71	MSE:	9.625746315577999e-05
Epoch	72	MSE:	8.583860471844673e-05
Epoch	73	MSE:	8.340943168150261e-05
Epoch	74	MSE:	8.440535748377442e-05
Epoch	75	MSE:	8.320466440636665e-05
Epoch	76	MSE:	8.254626300185919e-05
Epoch	77	MSE:	8.009742305148393e-05
Epoch	78	MSE:	7.412712147925049e-05
Epoch	79	MSE:	7.15123096597381e-05
Epoch	80	MSE:	7.358710718108341e-05
Epoch	81	MSE:	7.310714136110619e-05
Epoch	82	MSE:	6.953116826480255e-05
Epoch	83	MSE:	6.719074735883623e-05
Epoch	84	MSE:	6.551983096869662e-05
Epoch	85	MSE:	6.406907050404698e-05
Epoch	86	MSE:	6.425779429264367e-05
Epoch	87	MSE:	6.349282921291888e-05
Epoch	88	MSE:	6.041178494342603e-05


```

Epoch 89 MSE: 5.863324258825742e-05
Epoch 90 MSE: 5.855519702890888e-05
Epoch 91 MSE: 5.7753361033974215e-05
Epoch 92 MSE: 5.657515794155188e-05
Epoch 93 MSE: 5.542938379221596e-05
Epoch 94 MSE: 5.378471178119071e-05
Epoch 95 MSE: 5.2909286750946194e-05
Epoch 96 MSE: 5.285746738081798e-05
Epoch 97 MSE: 5.1871349569410086e-05
Epoch 98 MSE: 5.046280057285912e-05
Epoch 99 MSE: 4.9680045776767656e-05
T-time: 118.29136538505554

```

```

=====
Train Score: 0.21 RMSE
=====
Validation Score: 4.30 RMSE
=====

```

```

=====
Time Step = 100 | Hidden States = 2 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.09296241402626038
Epoch 1 MSE: 0.08490736037492752
Epoch 2 MSE: 0.07796050608158112
Epoch 3 MSE: 0.07196546345949173
Epoch 4 MSE: 0.06678205728530884
Epoch 5 MSE: 0.0622895248234272
Epoch 6 MSE: 0.058386825025081635
Epoch 7 MSE: 0.054990459233522415
Epoch 8 MSE: 0.05203188210725784
Epoch 9 MSE: 0.04945502430200577
Epoch 10 MSE: 0.04721391201019287
Epoch 11 MSE: 0.04527059942483902
Epoch 12 MSE: 0.04359336197376251
Epoch 13 MSE: 0.042155180126428604
Epoch 14 MSE: 0.04093251749873161
Epoch 15 MSE: 0.03990435227751732
Epoch 16 MSE: 0.03905146196484566
Epoch 17 MSE: 0.03835587576031685
Epoch 18 MSE: 0.03780050575733185
Epoch 19 MSE: 0.037368934601545334
Epoch 20 MSE: 0.03704529255628586
Epoch 21 MSE: 0.03681425005197525
Epoch 22 MSE: 0.0366610586643219
Epoch 23 MSE: 0.0365716926753521
Epoch 24 MSE: 0.0365329384803772

```

Epoch	25	MSE:	0.03653256595134735
Epoch	26	MSE:	0.03655946999788284
Epoch	27	MSE:	0.03660377487540245
Epoch	28	MSE:	0.0366569384932518
Epoch	29	MSE:	0.03671179339289665
Epoch	30	MSE:	0.0367625467479229
Epoch	31	MSE:	0.036804769188165665
Epoch	32	MSE:	0.036835283041000366
Epoch	33	MSE:	0.03685208037495613
Epoch	34	MSE:	0.036854200065135956
Epoch	35	MSE:	0.03684153035283089
Epoch	36	MSE:	0.03681469336152077
Epoch	37	MSE:	0.03677484765648842
Epoch	38	MSE:	0.036723542958498
Epoch	39	MSE:	0.036662567406892776
Epoch	40	MSE:	0.03659380227327347
Epoch	41	MSE:	0.0365191288292408
Epoch	42	MSE:	0.03644028678536415
Epoch	43	MSE:	0.03635885566473007
Epoch	44	MSE:	0.03627614304423332
Epoch	45	MSE:	0.03619317337870598
Epoch	46	MSE:	0.036110661923885345
Epoch	47	MSE:	0.03602901101112366
Epoch	48	MSE:	0.03594832494854927
Epoch	49	MSE:	0.03586842119693756
Epoch	50	MSE:	0.035788845270872116
Epoch	51	MSE:	0.03570893779397011
Epoch	52	MSE:	0.0356278195977211
Epoch	53	MSE:	0.03554445877671242
Epoch	54	MSE:	0.035457707941532135
Epoch	55	MSE:	0.03536628931760788
Epoch	56	MSE:	0.035268861800432205
Epoch	57	MSE:	0.035163991153240204
Epoch	58	MSE:	0.03505019471049309
Epoch	59	MSE:	0.034925904124975204
Epoch	60	MSE:	0.03478946164250374
Epoch	61	MSE:	0.03463910147547722
Epoch	62	MSE:	0.03447289019823074
Epoch	63	MSE:	0.03428870067000389
Epoch	64	MSE:	0.034084126353263855
Epoch	65	MSE:	0.03385641425848007
Epoch	66	MSE:	0.033602386713027954
Epoch	67	MSE:	0.03331829607486725
Epoch	68	MSE:	0.03299974650144577
Epoch	69	MSE:	0.03264150395989418
Epoch	70	MSE:	0.03223734721541405
Epoch	71	MSE:	0.03177986666560173
Epoch	72	MSE:	0.031260229647159576

```

Epoch 73 MSE: 0.03066794015467167
Epoch 74 MSE: 0.029990559443831444
Epoch 75 MSE: 0.02921343222260475
Epoch 76 MSE: 0.028319498524069786
Epoch 77 MSE: 0.027289269492030144
Epoch 78 MSE: 0.02610117197036743
Epoch 79 MSE: 0.02473251335322857
Epoch 80 MSE: 0.023161297664046288
Epoch 81 MSE: 0.021369310095906258
Epoch 82 MSE: 0.019346803426742554
Epoch 83 MSE: 0.017098741605877876
Epoch 84 MSE: 0.014652257785201073
Epoch 85 MSE: 0.012064670212566853
Epoch 86 MSE: 0.009432402439415455
Epoch 87 MSE: 0.00690201623365283
Epoch 88 MSE: 0.004683455917984247
Epoch 89 MSE: 0.003051463980227709
Epoch 90 MSE: 0.002287411829456687
Epoch 91 MSE: 0.002501443726941943
Epoch 92 MSE: 0.0034281257539987564
Epoch 93 MSE: 0.004526535049080849
Epoch 94 MSE: 0.005260735750198364
Epoch 95 MSE: 0.005291784647852182
Epoch 96 MSE: 0.004657451529055834
Epoch 97 MSE: 0.003696856088936329
Epoch 98 MSE: 0.0027559753507375717
Epoch 99 MSE: 0.002018391154706478
T-time: 19.67540192604065

```

```

=====
Train Score: 1.34 RMSE
=====
Validation Score: 17.04 RMSE
=====

```

```

=====
Time Step = 100 | Hidden States = 2 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.03757014870643616
Epoch 1 MSE: 0.035759087651968
Epoch 2 MSE: 0.03470347076654434
Epoch 3 MSE: 0.034365344792604446
Epoch 4 MSE: 0.03423583135008812
Epoch 5 MSE: 0.033719275146722794
Epoch 6 MSE: 0.03269758075475693
Epoch 7 MSE: 0.031327392905950546
Epoch 8 MSE: 0.029827622696757317

```

Epoch 9 MSE: 0.028416592627763748
 Epoch 10 MSE: 0.027128664776682854
 Epoch 11 MSE: 0.02559136040508747
 Epoch 12 MSE: 0.023448366671800613
 Epoch 13 MSE: 0.020838482305407524
 Epoch 14 MSE: 0.01840825565159321
 Epoch 15 MSE: 0.016567770391702652
 Epoch 16 MSE: 0.014401930384337902
 Epoch 17 MSE: 0.011436816304922104
 Epoch 18 MSE: 0.008930226787924767
 Epoch 19 MSE: 0.00781531073153019
 Epoch 20 MSE: 0.006154195871204138
 Epoch 21 MSE: 0.0058225481770932674
 Epoch 22 MSE: 0.005974465515464544
 Epoch 23 MSE: 0.005686506163328886
 Epoch 24 MSE: 0.006510378327220678
 Epoch 25 MSE: 0.0059570688754320145
 Epoch 26 MSE: 0.005662937648594379
 Epoch 27 MSE: 0.005092678125947714
 Epoch 28 MSE: 0.004084356129169464
 Epoch 29 MSE: 0.003281258512288332
 Epoch 30 MSE: 0.0028001833707094193
 Epoch 31 MSE: 0.002393109258264303
 Epoch 32 MSE: 0.0020651654340326786
 Epoch 33 MSE: 0.001931160455569625
 Epoch 34 MSE: 0.0019768422935158014
 Epoch 35 MSE: 0.002096262527629733
 Epoch 36 MSE: 0.0021933584939688444
 Epoch 37 MSE: 0.0022300512064248323
 Epoch 38 MSE: 0.002213100902736187
 Epoch 39 MSE: 0.002150636864826083
 Epoch 40 MSE: 0.0020331861451268196
 Epoch 41 MSE: 0.0018589104292914271
 Epoch 42 MSE: 0.0016633066115900874
 Epoch 43 MSE: 0.001505827298387885
 Epoch 44 MSE: 0.0014224156038835645
 Epoch 45 MSE: 0.0014003143878653646
 Epoch 46 MSE: 0.0014050272293388844
 Epoch 47 MSE: 0.0014197819400578737
 Epoch 48 MSE: 0.001442149979993701
 Epoch 49 MSE: 0.001451926538720727
 Epoch 50 MSE: 0.0014167896006256342
 Epoch 51 MSE: 0.0013361700112000108
 Epoch 52 MSE: 0.0012440261198207736
 Epoch 53 MSE: 0.0011633863905444741
 Epoch 54 MSE: 0.001092401216737926
 Epoch 55 MSE: 0.0010337869171053171
 Epoch 56 MSE: 0.001002084813080728

Epoch 57 MSE: 0.0009962784824892879
Epoch 58 MSE: 0.0009943183977156878
Epoch 59 MSE: 0.0009822127176448703
Epoch 60 MSE: 0.0009639847557991743
Epoch 61 MSE: 0.0009403831791132689
Epoch 62 MSE: 0.0009044234175235033
Epoch 63 MSE: 0.0008606864721514285
Epoch 64 MSE: 0.00082381785614416
Epoch 65 MSE: 0.0007967219571582973
Epoch 66 MSE: 0.00077393080573529
Epoch 67 MSE: 0.0007589589222334325
Epoch 68 MSE: 0.0007531272131018341
Epoch 69 MSE: 0.0007458498002961278
Epoch 70 MSE: 0.0007334661786444485
Epoch 71 MSE: 0.0007202313863672316
Epoch 72 MSE: 0.000702688645105809
Epoch 73 MSE: 0.0006804171134717762
Epoch 74 MSE: 0.0006609608535654843
Epoch 75 MSE: 0.0006443773745559156
Epoch 76 MSE: 0.0006289047887548804
Epoch 77 MSE: 0.0006180350319482386
Epoch 78 MSE: 0.0006094941636547446
Epoch 79 MSE: 0.0005992921069264412
Epoch 80 MSE: 0.0005890168249607086
Epoch 81 MSE: 0.0005774687160737813
Epoch 82 MSE: 0.0005631148815155029
Epoch 83 MSE: 0.000549165706615895
Epoch 84 MSE: 0.0005359533824957907
Epoch 85 MSE: 0.0005230863462202251
Epoch 86 MSE: 0.0005126994219608605
Epoch 87 MSE: 0.0005033726920373738
Epoch 88 MSE: 0.0004940424696542323
Epoch 89 MSE: 0.00048536784015595913
Epoch 90 MSE: 0.00047562248073518276
Epoch 91 MSE: 0.0004652483039535582
Epoch 92 MSE: 0.00045510014751926064
Epoch 93 MSE: 0.0004446381935849786
Epoch 94 MSE: 0.0004351628595031798
Epoch 95 MSE: 0.00042649023816920817
Epoch 96 MSE: 0.0004181626718491316
Epoch 97 MSE: 0.0004105399420950562
Epoch 98 MSE: 0.0004026142123620957
Epoch 99 MSE: 0.00039456156082451344
T-time: 36.11147928237915

=====
Train Score: 0.59 RMSE
=====

Validation Score: 13.52 RMSE

=====

=====

Time Step = 100 | Hidden States = 4 | Num Layers = 1

=====

Epoch	0	MSE:	0.047738198190927505
Epoch	1	MSE:	0.040429241955280304
Epoch	2	MSE:	0.03553101792931557
Epoch	3	MSE:	0.03246256336569786
Epoch	4	MSE:	0.0306486077606678
Epoch	5	MSE:	0.029499348253011703
Epoch	6	MSE:	0.028396207839250565
Epoch	7	MSE:	0.026875413954257965
Epoch	8	MSE:	0.02472655288875103
Epoch	9	MSE:	0.02195456065237522
Epoch	10	MSE:	0.01871735416352749
Epoch	11	MSE:	0.01528440322726965
Epoch	12	MSE:	0.012003621086478233
Epoch	13	MSE:	0.00923629105091095
Epoch	14	MSE:	0.007214946206659079
Epoch	15	MSE:	0.005834117531776428
Epoch	16	MSE:	0.004652660805732012
Epoch	17	MSE:	0.003391194622963667
Epoch	18	MSE:	0.0023170365020632744
Epoch	19	MSE:	0.0020118425600230694
Epoch	20	MSE:	0.002746606944128871
Epoch	21	MSE:	0.004003746900707483
Epoch	22	MSE:	0.004875405691564083
Epoch	23	MSE:	0.004906369373202324
Epoch	24	MSE:	0.004260003101080656
Epoch	25	MSE:	0.003375283908098936
Epoch	26	MSE:	0.002627784851938486
Epoch	27	MSE:	0.002156247152015567
Epoch	28	MSE:	0.001883818069472909
Epoch	29	MSE:	0.0016774075338616967
Epoch	30	MSE:	0.0014813164016231894
Epoch	31	MSE:	0.0013242029817774892
Epoch	32	MSE:	0.0012551528634503484
Epoch	33	MSE:	0.0012917779386043549
Epoch	34	MSE:	0.0014068282907828689
Epoch	35	MSE:	0.0015432883519679308
Epoch	36	MSE:	0.0016406342620030046
Epoch	37	MSE:	0.0016579123912379146
Epoch	38	MSE:	0.0015854082303121686
Epoch	39	MSE:	0.0014431336894631386
Epoch	40	MSE:	0.0012692498276010156

Epoch	41	MSE:	0.0011039464734494686
Epoch	42	MSE:	0.0009748924057930708
Epoch	43	MSE:	0.0008896940271370113
Epoch	44	MSE:	0.000838382460642606
Epoch	45	MSE:	0.0008042805711738765
Epoch	46	MSE:	0.0007763918838463724
Epoch	47	MSE:	0.000755088112782687
Epoch	48	MSE:	0.0007476064492948353
Epoch	49	MSE:	0.0007577589130960405
Epoch	50	MSE:	0.0007785861380398273
Epoch	51	MSE:	0.00079396553337574
Epoch	52	MSE:	0.0007878605392761528
Epoch	53	MSE:	0.0007541421218775213
Epoch	54	MSE:	0.0007000665063969791
Epoch	55	MSE:	0.0006415907992050052
Epoch	56	MSE:	0.0005942978314124048
Epoch	57	MSE:	0.0005659176968038082
Epoch	58	MSE:	0.0005544981686398387
Epoch	59	MSE:	0.0005521701532416046
Epoch	60	MSE:	0.0005510322516784072
Epoch	61	MSE:	0.0005471139447763562
Epoch	62	MSE:	0.0005405788542702794
Epoch	63	MSE:	0.0005332086584530771
Epoch	64	MSE:	0.0005256850854493678
Epoch	65	MSE:	0.0005166832706891
Epoch	66	MSE:	0.0005040796240791678
Epoch	67	MSE:	0.000487044540932402
Epoch	68	MSE:	0.00046729345922358334
Epoch	69	MSE:	0.00044850539416074753
Epoch	70	MSE:	0.000434272427810356
Epoch	71	MSE:	0.0004259988490957767
Epoch	72	MSE:	0.00042221855255775154
Epoch	73	MSE:	0.0004197638772893697
Epoch	74	MSE:	0.0004158549418207258
Epoch	75	MSE:	0.0004095397307537496
Epoch	76	MSE:	0.00040157148032449186
Epoch	77	MSE:	0.0003931584069505334
Epoch	78	MSE:	0.00038483331445604563
Epoch	79	MSE:	0.00037634256295859814
Epoch	80	MSE:	0.0003673832688946277
Epoch	81	MSE:	0.0003582986246328801
Epoch	82	MSE:	0.0003500301099848002
Epoch	83	MSE:	0.0003434023237787187
Epoch	84	MSE:	0.00033842588891275227
Epoch	85	MSE:	0.00033423909917473793
Epoch	86	MSE:	0.00032971560722216964
Epoch	87	MSE:	0.00032420840580016375
Epoch	88	MSE:	0.0003178456681780517

```

Epoch 89 MSE: 0.0003112302510999143
Epoch 90 MSE: 0.0003048937942367047
Epoch 91 MSE: 0.00029898426146246493
Epoch 92 MSE: 0.0002933725481852889
Epoch 93 MSE: 0.0002879634266719222
Epoch 94 MSE: 0.00028285355074331164
Epoch 95 MSE: 0.0002781953080557287
Epoch 96 MSE: 0.0002739467890933156
Epoch 97 MSE: 0.0002698028110899031
Epoch 98 MSE: 0.00026539983809925616
Epoch 99 MSE: 0.0002606010821182281
T-time: 23.211425065994263

```

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=====
```

```
Train Score: 0.48 RMSE
```

```
=====
```

```
Validation Score: 10.24 RMSE
```

```
=====
```

```
=====
```

```
Time Step = 100 | Hidden States = 4 | Num Layers = 2
```

```
=====
```

```

Epoch 0 MSE: 0.33258312940597534
Epoch 1 MSE: 0.29062601923942566
Epoch 2 MSE: 0.2531641125679016
Epoch 3 MSE: 0.21987710893154144
Epoch 4 MSE: 0.19017575681209564
Epoch 5 MSE: 0.16344496607780457
Epoch 6 MSE: 0.1391313672065735
Epoch 7 MSE: 0.11682521551847458
Epoch 8 MSE: 0.09630223363637924
Epoch 9 MSE: 0.07756947726011276
Epoch 10 MSE: 0.06090836226940155
Epoch 11 MSE: 0.04689425230026245
Epoch 12 MSE: 0.03636058419942856
Epoch 13 MSE: 0.030248815193772316
Epoch 14 MSE: 0.0292274821549654
Epoch 15 MSE: 0.032922111451625824
Epoch 16 MSE: 0.03909347578883171
Epoch 17 MSE: 0.044492024928331375
Epoch 18 MSE: 0.047076307237148285
Epoch 19 MSE: 0.04663035273551941
Epoch 20 MSE: 0.04399454966187477
Epoch 21 MSE: 0.04029930755496025
Epoch 22 MSE: 0.03652936592698097
Epoch 23 MSE: 0.033341217786073685
Epoch 24 MSE: 0.031042836606502533

```


Epoch	25	MSE:	0.02966557815670967
Epoch	26	MSE:	0.02906852960586548
Epoch	27	MSE:	0.02903353050351143
Epoch	28	MSE:	0.029331985861063004
Epoch	29	MSE:	0.02976262755692005
Epoch	30	MSE:	0.030167700722813606
Epoch	31	MSE:	0.030436092987656593
Epoch	32	MSE:	0.030499888584017754
Epoch	33	MSE:	0.03032820299267769
Epoch	34	MSE:	0.029920300468802452
Epoch	35	MSE:	0.029298918321728706
Epoch	36	MSE:	0.02850397862493992
Epoch	37	MSE:	0.02758663147687912
Epoch	38	MSE:	0.026603475213050842
Epoch	39	MSE:	0.025610627606511116
Epoch	40	MSE:	0.02465767227113247
Epoch	41	MSE:	0.02378149889409542
Epoch	42	MSE:	0.023000568151474
Epoch	43	MSE:	0.022310558706521988
Epoch	44	MSE:	0.021682891994714737
Epoch	45	MSE:	0.02106757089495659
Epoch	46	MSE:	0.02040144056081772
Epoch	47	MSE:	0.01962118037045002
Epoch	48	MSE:	0.01867874339222908
Epoch	49	MSE:	0.017554378136992455
Epoch	50	MSE:	0.0162627175450325
Epoch	51	MSE:	0.014849340543150902
Epoch	52	MSE:	0.013378355652093887
Epoch	53	MSE:	0.011915639042854309
Epoch	54	MSE:	0.010513297282159328
Epoch	55	MSE:	0.009200314991176128
Epoch	56	MSE:	0.007981760427355766
Epoch	57	MSE:	0.006846279837191105
Epoch	58	MSE:	0.005779368337243795
Epoch	59	MSE:	0.004778633359819651
Epoch	60	MSE:	0.00386548088863492
Epoch	61	MSE:	0.003087251912802458
Epoch	62	MSE:	0.0025059652980417013
Epoch	63	MSE:	0.002175077795982361
Epoch	64	MSE:	0.002111639128997922
Epoch	65	MSE:	0.002275001723319292
Epoch	66	MSE:	0.0025655378121882677
Epoch	67	MSE:	0.00285543967038393
Epoch	68	MSE:	0.0030417221132665873
Epoch	69	MSE:	0.0030816704966127872
Epoch	70	MSE:	0.002986377105116844
Epoch	71	MSE:	0.0027920331340283155
Epoch	72	MSE:	0.0025376547127962112

```

Epoch 73 MSE: 0.0022573587484657764
Epoch 74 MSE: 0.0019800940062850714
Epoch 75 MSE: 0.0017285466892644763
Epoch 76 MSE: 0.0015173471765592694
Epoch 77 MSE: 0.001353548956103623
Epoch 78 MSE: 0.001238701050169766
Epoch 79 MSE: 0.0011704335920512676
Epoch 80 MSE: 0.0011429558508098125
Epoch 81 MSE: 0.00114717916585505
Epoch 82 MSE: 0.0011714097345247865
Epoch 83 MSE: 0.0012029851786792278
Epoch 84 MSE: 0.001230497844517231
Epoch 85 MSE: 0.0012457927223294973
Epoch 86 MSE: 0.0012449806090444326
Epoch 87 MSE: 0.0012281632516533136
Epoch 88 MSE: 0.0011981581337749958
Epoch 89 MSE: 0.0011588805355131626
Epoch 90 MSE: 0.0011140656424686313
Epoch 91 MSE: 0.0010667078895494342
Epoch 92 MSE: 0.001019171206280589
Epoch 93 MSE: 0.0009736159117892385
Epoch 94 MSE: 0.0009322951082140207
Epoch 95 MSE: 0.0008974524680525064
Epoch 96 MSE: 0.000870835967361927
Epoch 97 MSE: 0.0008531032362952828
Epoch 98 MSE: 0.0008434776682406664
Epoch 99 MSE: 0.0008398796198889613
T-time: 44.2719566822052

```

```
=====
```

```
Train Score: 0.86 RMSE
```

```
=====
```

```
Validation Score: 15.40 RMSE
```

```
=====
```

```
=====
```

```
Time Step = 100 | Hidden States = 8 | Num Layers = 1
```

```
=====
```

```

Epoch 0 MSE: 0.05871938541531563
Epoch 1 MSE: 0.04353747144341469
Epoch 2 MSE: 0.03325658291578293
Epoch 3 MSE: 0.027822744101285934
Epoch 4 MSE: 0.026786265894770622
Epoch 5 MSE: 0.0286156814545393
Epoch 6 MSE: 0.03057032823562622
Epoch 7 MSE: 0.03083725832402706
Epoch 8 MSE: 0.02938738651573658

```

Epoch 9 MSE: 0.0269965548068285
 Epoch 10 MSE: 0.024467412382364273
 Epoch 11 MSE: 0.02233392745256424
 Epoch 12 MSE: 0.02081373706459999
 Epoch 13 MSE: 0.019866300746798515
 Epoch 14 MSE: 0.01928551308810711
 Epoch 15 MSE: 0.018792912364006042
 Epoch 16 MSE: 0.01811734214425087
 Epoch 17 MSE: 0.0170555729418993
 Epoch 18 MSE: 0.015511000528931618
 Epoch 19 MSE: 0.013509504497051239
 Epoch 20 MSE: 0.01119410153478384
 Epoch 21 MSE: 0.008800046518445015
 Epoch 22 MSE: 0.00660706078633666
 Epoch 23 MSE: 0.004855883773416281
 Epoch 24 MSE: 0.0036227693781256676
 Epoch 25 MSE: 0.002732496475800872
 Epoch 26 MSE: 0.001933024381287396
 Epoch 27 MSE: 0.0012859932612627745
 Epoch 28 MSE: 0.0012038347776979208
 Epoch 29 MSE: 0.0019754169043153524
 Epoch 30 MSE: 0.0030916875693947077
 Epoch 31 MSE: 0.0035461783409118652
 Epoch 32 MSE: 0.00293860980309546
 Epoch 33 MSE: 0.0017121084965765476
 Epoch 34 MSE: 0.000615960278082639
 Epoch 35 MSE: 0.00016764744941610843
 Epoch 36 MSE: 0.0003779013641178608
 Epoch 37 MSE: 0.0008396260673180223
 Epoch 38 MSE: 0.0011209191288799047
 Epoch 39 MSE: 0.0010897974716499448
 Epoch 40 MSE: 0.0008933315984904766
 Epoch 41 MSE: 0.0007368969381786883
 Epoch 42 MSE: 0.0007166825234889984
 Epoch 43 MSE: 0.0007908034021966159
 Epoch 44 MSE: 0.0008454860653728247
 Epoch 45 MSE: 0.0007847151136957109
 Epoch 46 MSE: 0.0005919371033087373
 Epoch 47 MSE: 0.00034016818972304463
 Epoch 48 MSE: 0.00014951196499168873
 Epoch 49 MSE: 0.00011041483230656013
 Epoch 50 MSE: 0.00021423200087156147
 Epoch 51 MSE: 0.0003512078255880624
 Epoch 52 MSE: 0.0004017511964775622
 Epoch 53 MSE: 0.0003428218769840896
 Epoch 54 MSE: 0.00025104175438173115
 Epoch 55 MSE: 0.0002077051904052496
 Epoch 56 MSE: 0.00022308871848508716

```

Epoch 57 MSE: 0.00024785444838926196
Epoch 58 MSE: 0.00023423777020070702
Epoch 59 MSE: 0.00017898279475048184
Epoch 60 MSE: 0.00011886670836247504
Epoch 61 MSE: 9.461567969992757e-05
Epoch 62 MSE: 0.00011691165855154395
Epoch 63 MSE: 0.00016031123232096434
Epoch 64 MSE: 0.00018712003657128662
Epoch 65 MSE: 0.00017857567581813782
Epoch 66 MSE: 0.00014606190961785614
Epoch 67 MSE: 0.0001158704690169543
Epoch 68 MSE: 0.00010522508819121867
Epoch 69 MSE: 0.00011103033466497436
Epoch 70 MSE: 0.00011755001469282433
Epoch 71 MSE: 0.00011277392331976444
Epoch 72 MSE: 9.854247764451429e-05
Epoch 73 MSE: 8.699481259100139e-05
Epoch 74 MSE: 8.788908598944545e-05
Epoch 75 MSE: 9.894956019707024e-05
Epoch 76 MSE: 0.00010837974696187302
Epoch 77 MSE: 0.00010665575973689556
Epoch 78 MSE: 9.516729915048927e-05
Epoch 79 MSE: 8.335062739206478e-05
Epoch 80 MSE: 7.884449587436393e-05
Epoch 81 MSE: 8.136353426380083e-05
Epoch 82 MSE: 8.504605648340657e-05
Epoch 83 MSE: 8.506185258738697e-05
Epoch 84 MSE: 8.160459401551634e-05
Epoch 85 MSE: 7.841096521588042e-05
Epoch 86 MSE: 7.832174014765769e-05
Epoch 87 MSE: 8.04966693976894e-05
Epoch 88 MSE: 8.166061161318794e-05
Epoch 89 MSE: 7.965227268869057e-05
Epoch 90 MSE: 7.550739974249154e-05
Epoch 91 MSE: 7.217404345283285e-05
Epoch 92 MSE: 7.153813930926844e-05
Epoch 93 MSE: 7.287967309821397e-05
Epoch 94 MSE: 7.401148468488827e-05
Epoch 95 MSE: 7.356157584581524e-05
Epoch 96 MSE: 7.202611595857888e-05
Epoch 97 MSE: 7.081301009748131e-05
Epoch 98 MSE: 7.058781920932233e-05
Epoch 99 MSE: 7.071816071402282e-05
T-time: 22.46944284439087

```

```

=====
Train Score: 0.25 RMSE
=====

```

Validation Score: 5.98 RMSE

=====

=====

Time Step = 100 | Hidden States = 8 | Num Layers = 2

=====

Epoch	0	MSE:	0.13075894117355347
Epoch	1	MSE:	0.10015342384576797
Epoch	2	MSE:	0.07629898190498352
Epoch	3	MSE:	0.05839548259973526
Epoch	4	MSE:	0.045830946415662766
Epoch	5	MSE:	0.03825041651725769
Epoch	6	MSE:	0.03539297357201576
Epoch	7	MSE:	0.036596767604351044
Epoch	8	MSE:	0.04001840949058533
Epoch	9	MSE:	0.04297458007931709
Epoch	10	MSE:	0.04389478638768196
Epoch	11	MSE:	0.04281473532319069
Epoch	12	MSE:	0.04053224250674248
Epoch	13	MSE:	0.03791951760649681
Epoch	14	MSE:	0.03561560437083244
Epoch	15	MSE:	0.033950939774513245
Epoch	16	MSE:	0.03298955038189888
Epoch	17	MSE:	0.032615430653095245
Epoch	18	MSE:	0.032617516815662384
Epoch	19	MSE:	0.032752860337495804
Epoch	20	MSE:	0.032788608223199844
Epoch	21	MSE:	0.032531462609767914
Epoch	22	MSE:	0.031844861805438995
Epoch	23	MSE:	0.030649691820144653
Epoch	24	MSE:	0.02891286462545395
Epoch	25	MSE:	0.026637956500053406
Epoch	26	MSE:	0.023879487067461014
Epoch	27	MSE:	0.020791860297322273
Epoch	28	MSE:	0.017684681341052055
Epoch	29	MSE:	0.014902613125741482
Epoch	30	MSE:	0.012307497672736645
Epoch	31	MSE:	0.009241415187716484
Epoch	32	MSE:	0.005995589308440685
Epoch	33	MSE:	0.004672303795814514
Epoch	34	MSE:	0.005806285887956619
Epoch	35	MSE:	0.007529782596975565
Epoch	36	MSE:	0.007813637144863605
Epoch	37	MSE:	0.006814444437623024
Epoch	38	MSE:	0.0058206734247505665
Epoch	39	MSE:	0.004657034296542406
Epoch	40	MSE:	0.0037331702187657356

Epoch	41	MSE:	0.003141269786283374
Epoch	42	MSE:	0.00284378114156425
Epoch	43	MSE:	0.003028601175174117
Epoch	44	MSE:	0.003375150728970766
Epoch	45	MSE:	0.0036793502513319254
Epoch	46	MSE:	0.003819623263552785
Epoch	47	MSE:	0.003733944147825241
Epoch	48	MSE:	0.003440840868279338
Epoch	49	MSE:	0.003012491390109062
Epoch	50	MSE:	0.00254845037125051
Epoch	51	MSE:	0.002149657579138875
Epoch	52	MSE:	0.001890439074486494
Epoch	53	MSE:	0.0017907461151480675
Epoch	54	MSE:	0.0018027947517111897
Epoch	55	MSE:	0.0018354766070842743
Epoch	56	MSE:	0.0018078446155413985
Epoch	57	MSE:	0.001689172233454883
Epoch	58	MSE:	0.0015012259827926755
Epoch	59	MSE:	0.0012924200855195522
Epoch	60	MSE:	0.0011097835376858711
Epoch	61	MSE:	0.0009835674427449703
Epoch	62	MSE:	0.0009224585955962539
Epoch	63	MSE:	0.0009138882160186768
Epoch	64	MSE:	0.0009293488692492247
Epoch	65	MSE:	0.0009363980498164892
Epoch	66	MSE:	0.0009136807639151812
Epoch	67	MSE:	0.00085994484834373
Epoch	68	MSE:	0.0007906720275059342
Epoch	69	MSE:	0.0007254399824887514
Epoch	70	MSE:	0.0006760186515748501
Epoch	71	MSE:	0.0006429825443774462
Epoch	72	MSE:	0.000620487320702523
Epoch	73	MSE:	0.0006027084891684353
Epoch	74	MSE:	0.000586078327614814
Epoch	75	MSE:	0.0005672219558618963
Epoch	76	MSE:	0.0005414015613496304
Epoch	77	MSE:	0.0005052406922914088
Epoch	78	MSE:	0.000461429386632517
Epoch	79	MSE:	0.0004191585467197001
Epoch	80	MSE:	0.0003878757415805012
Epoch	81	MSE:	0.0003697190259117633
Epoch	82	MSE:	0.0003581104683689773
Epoch	83	MSE:	0.00034377191332168877
Epoch	84	MSE:	0.0003221968945581466
Epoch	85	MSE:	0.00029595629894174635
Epoch	86	MSE:	0.0002708534593693912
Epoch	87	MSE:	0.00025062114582397044
Epoch	88	MSE:	0.00023523569689132273

```

Epoch 89 MSE: 0.00022313122462946922
Epoch 90 MSE: 0.00021329012815840542
Epoch 91 MSE: 0.00020463964028749615
Epoch 92 MSE: 0.00019494745356496423
Epoch 93 MSE: 0.0001822451886255294
Epoch 94 MSE: 0.0001675381645327434
Epoch 95 MSE: 0.00015468036872334778
Epoch 96 MSE: 0.00014645629562437534
Epoch 97 MSE: 0.00014128095062915236
Epoch 98 MSE: 0.0001349310332443565
Epoch 99 MSE: 0.0001253420632565394
T-time: 57.300408124923706

```

```
=====
```

```
Train Score: 0.33 RMSE
```

```
=====
```

```
Validation Score: 12.26 RMSE
```

```
=====
```

```
=====
```

```
Time Step = 100 | Hidden States = 16 | Num Layers = 1
```

```
=====
```

```

Epoch 0 MSE: 0.033007457852363586
Epoch 1 MSE: 0.03091491013765335
Epoch 2 MSE: 0.02837585099041462
Epoch 3 MSE: 0.026143671944737434
Epoch 4 MSE: 0.023220224305987358
Epoch 5 MSE: 0.020351404324173927
Epoch 6 MSE: 0.016576416790485382
Epoch 7 MSE: 0.011893784627318382
Epoch 8 MSE: 0.006953970063477755
Epoch 9 MSE: 0.0017223827308043838
Epoch 10 MSE: 0.0013125704135745764
Epoch 11 MSE: 0.009196791797876358
Epoch 12 MSE: 0.0055700428783893585
Epoch 13 MSE: 0.0032399592455476522
Epoch 14 MSE: 0.00031839017174206674
Epoch 15 MSE: 0.0005764124798588455
Epoch 16 MSE: 0.001517368364147842
Epoch 17 MSE: 0.0017492903862148523
Epoch 18 MSE: 0.00199122354388237
Epoch 19 MSE: 0.0024767257273197174
Epoch 20 MSE: 0.0026487696450203657
Epoch 21 MSE: 0.0022579950746148825
Epoch 22 MSE: 0.001706449082121253
Epoch 23 MSE: 0.0013539415085688233
Epoch 24 MSE: 0.0010543138487264514

```

Epoch 25 MSE: 0.0005725394585169852
 Epoch 26 MSE: 0.00014546909369528294
 Epoch 27 MSE: 0.0001523545797681436
 Epoch 28 MSE: 0.0003923018812201917
 Epoch 29 MSE: 0.0004900931962765753
 Epoch 30 MSE: 0.0006314293714240193
 Epoch 31 MSE: 0.0008382342057302594
 Epoch 32 MSE: 0.0007413790444843471
 Epoch 33 MSE: 0.0004564863338600844
 Epoch 34 MSE: 0.0003044781042262912
 Epoch 35 MSE: 0.00020962183771189302
 Epoch 36 MSE: 9.004815365187824e-05
 Epoch 37 MSE: 7.70361875765957e-05
 Epoch 38 MSE: 0.00018023853772319853
 Epoch 39 MSE: 0.0002591356751509011
 Epoch 40 MSE: 0.00027108623180538416
 Epoch 41 MSE: 0.00028217636281624436
 Epoch 42 MSE: 0.00029861938674002886
 Epoch 43 MSE: 0.0002603227330837399
 Epoch 44 MSE: 0.00017500758985988796
 Epoch 45 MSE: 0.00011495018407003954
 Epoch 46 MSE: 9.315997158410028e-05
 Epoch 47 MSE: 6.925844354555011e-05
 Epoch 48 MSE: 5.489864997798577e-05
 Epoch 49 MSE: 8.475816866848618e-05
 Epoch 50 MSE: 0.00012363979476504028
 Epoch 51 MSE: 0.00012850981147494167
 Epoch 52 MSE: 0.00012260876246728003
 Epoch 53 MSE: 0.0001190205366583541
 Epoch 54 MSE: 9.450591460336e-05
 Epoch 55 MSE: 6.148278043838218e-05
 Epoch 56 MSE: 5.051636617281474e-05
 Epoch 57 MSE: 5.269060784485191e-05
 Epoch 58 MSE: 5.208008224144578e-05
 Epoch 59 MSE: 5.824834079248831e-05
 Epoch 60 MSE: 7.204093708423898e-05
 Epoch 61 MSE: 7.644862489541993e-05
 Epoch 62 MSE: 6.985025538597256e-05
 Epoch 63 MSE: 6.423674494726583e-05
 Epoch 64 MSE: 5.858202348463237e-05
 Epoch 65 MSE: 4.8044832510640845e-05
 Epoch 66 MSE: 4.122583050047979e-05
 Epoch 67 MSE: 4.3134481529705226e-05
 Epoch 68 MSE: 4.5853415940655395e-05
 Epoch 69 MSE: 4.726354018202983e-05
 Epoch 70 MSE: 5.1199367590015754e-05
 Epoch 71 MSE: 5.3080344514455646e-05
 Epoch 72 MSE: 4.936729237670079e-05


```
Epoch 73 MSE: 4.555728446575813e-05
Epoch 74 MSE: 4.3411084334366024e-05
Epoch 75 MSE: 4.040699786855839e-05
Epoch 76 MSE: 3.901268064510077e-05
Epoch 77 MSE: 4.0871440432965755e-05
Epoch 78 MSE: 4.243810326443054e-05
Epoch 79 MSE: 4.274189268471673e-05
Epoch 80 MSE: 4.3413896491983905e-05
Epoch 81 MSE: 4.310686563258059e-05
Epoch 82 MSE: 4.106956475879997e-05
Epoch 83 MSE: 3.9579474105266854e-05
Epoch 84 MSE: 3.9053120417520404e-05
Epoch 85 MSE: 3.841067518806085e-05
Epoch 86 MSE: 3.852399822790176e-05
Epoch 87 MSE: 3.9513273804914206e-05
Epoch 88 MSE: 3.984130671597086e-05
Epoch 89 MSE: 3.962711707572453e-05
Epoch 90 MSE: 3.94948037865106e-05
Epoch 91 MSE: 3.883907265844755e-05
Epoch 92 MSE: 3.7981633795425296e-05
Epoch 93 MSE: 3.775999721256085e-05
Epoch 94 MSE: 3.7747679016320035e-05
Epoch 95 MSE: 3.7722173146903515e-05
Epoch 96 MSE: 3.80156998289749e-05
Epoch 97 MSE: 3.819164339802228e-05
Epoch 98 MSE: 3.7964946386637166e-05
Epoch 99 MSE: 3.774505603360012e-05
T-time: 40.32364630699158
```

```
=====
Train Score: 0.18 RMSE
=====
Validation Score: 5.10 RMSE
=====
```

```
=====
Time Step = 100 | Hidden States = 16 | Num Layers = 2
=====
```

```
Epoch 0 MSE: 0.05612000823020935
Epoch 1 MSE: 0.040825534611940384
Epoch 2 MSE: 0.036387186497449875
Epoch 3 MSE: 0.0393560491502285
Epoch 4 MSE: 0.038261983543634415
Epoch 5 MSE: 0.035820700228214264
Epoch 6 MSE: 0.03441285714507103
Epoch 7 MSE: 0.03395697474479675
Epoch 8 MSE: 0.033856626600027084
```

Epoch 9 MSE: 0.033652182668447495
Epoch 10 MSE: 0.03307400271296501
Epoch 11 MSE: 0.031984031200408936
Epoch 12 MSE: 0.030316993594169617
Epoch 13 MSE: 0.028052616864442825
Epoch 14 MSE: 0.02523685246706009
Epoch 15 MSE: 0.02193993516266346
Epoch 16 MSE: 0.017852814868092537
Epoch 17 MSE: 0.011992462910711765
Epoch 18 MSE: 0.0050193630158901215
Epoch 19 MSE: 0.0019249601755291224
Epoch 20 MSE: 0.005014969035983086
Epoch 21 MSE: 0.00858478806912899
Epoch 22 MSE: 0.008789739571511745
Epoch 23 MSE: 0.006146143190562725
Epoch 24 MSE: 0.003181742038577795
Epoch 25 MSE: 0.0016477768076583743
Epoch 26 MSE: 0.0015514163533225656
Epoch 27 MSE: 0.0021096887066960335
Epoch 28 MSE: 0.0027487846091389656
Epoch 29 MSE: 0.0032250836957246065
Epoch 30 MSE: 0.003366369754076004
Epoch 31 MSE: 0.003054184839129448
Epoch 32 MSE: 0.002364411950111389
Epoch 33 MSE: 0.0016039781039580703
Epoch 34 MSE: 0.0011582180159166455
Epoch 35 MSE: 0.0011258212616667151
Epoch 36 MSE: 0.0012073814868927002
Epoch 37 MSE: 0.0012979598250240088
Epoch 38 MSE: 0.001528239226900041
Epoch 39 MSE: 0.001707576448097825
Epoch 40 MSE: 0.0015654080780223012
Epoch 41 MSE: 0.0012145832879468799
Epoch 42 MSE: 0.0009441454894840717
Epoch 43 MSE: 0.0007875671144574881
Epoch 44 MSE: 0.0006568100652657449
Epoch 45 MSE: 0.0006310896133072674
Epoch 46 MSE: 0.0007485960959456861
Epoch 47 MSE: 0.0008649544906802475
Epoch 48 MSE: 0.0008532965439371765
Epoch 49 MSE: 0.000738271395675838
Epoch 50 MSE: 0.0006036448758095503
Epoch 51 MSE: 0.00047335520503111184
Epoch 52 MSE: 0.0003596632450353354
Epoch 53 MSE: 0.0003292229084763676
Epoch 54 MSE: 0.0003842818841803819
Epoch 55 MSE: 0.00042623362969607115
Epoch 56 MSE: 0.00040683706174604595

Epoch 57 MSE: 0.00035065438714809716
Epoch 58 MSE: 0.0002621755702421069
Epoch 59 MSE: 0.00017883522377815098
Epoch 60 MSE: 0.00016204423445742577
Epoch 61 MSE: 0.00019108592823613435
Epoch 62 MSE: 0.00021690888388548046
Epoch 63 MSE: 0.00021717888012062758
Epoch 64 MSE: 0.00017623172607272863
Epoch 65 MSE: 0.00011559934500837699
Epoch 66 MSE: 8.6177620687522e-05
Epoch 67 MSE: 9.424237941857427e-05
Epoch 68 MSE: 0.00011704571807058528
Epoch 69 MSE: 0.00012625240196939558
Epoch 70 MSE: 0.00010153144830837846
Epoch 71 MSE: 6.935966666787863e-05
Epoch 72 MSE: 5.3974075854057446e-05
Epoch 73 MSE: 6.393851072061807e-05
Epoch 74 MSE: 8.24724993435666e-05
Epoch 75 MSE: 7.99925546743907e-05
Epoch 76 MSE: 6.214877794263884e-05
Epoch 77 MSE: 4.5683329517487437e-05
Epoch 78 MSE: 4.8481746489414945e-05
Epoch 79 MSE: 6.107030640123412e-05
Epoch 80 MSE: 6.412016955437139e-05
Epoch 81 MSE: 5.556858377531171e-05
Epoch 82 MSE: 4.363113112049177e-05
Epoch 83 MSE: 4.520146831055172e-05
Epoch 84 MSE: 5.198198778089136e-05
Epoch 85 MSE: 5.570732901105657e-05
Epoch 86 MSE: 4.885900125373155e-05
Epoch 87 MSE: 4.253157749189995e-05
Epoch 88 MSE: 4.316795093473047e-05
Epoch 89 MSE: 4.775456545758061e-05
Epoch 90 MSE: 4.874771912000142e-05
Epoch 91 MSE: 4.3873664253624156e-05
Epoch 92 MSE: 4.049495328217745e-05
Epoch 93 MSE: 4.104908657609485e-05
Epoch 94 MSE: 4.412795169628225e-05
Epoch 95 MSE: 4.324260225985199e-05
Epoch 96 MSE: 4.0357947000302374e-05
Epoch 97 MSE: 3.8291669625323266e-05
Epoch 98 MSE: 3.970882607973181e-05
Epoch 99 MSE: 4.082772647961974e-05
T-time: 96.80281043052673

=====
Train Score: 0.19 RMSE
=====

Validation Score: 4.51 RMSE

=====

=====

Time Step = 100 | Hidden States = 32 | Num Layers = 1

=====

Epoch	0	MSE:	0.05514080077409744
Epoch	1	MSE:	0.03680483251810074
Epoch	2	MSE:	0.03248664364218712
Epoch	3	MSE:	0.034939780831336975
Epoch	4	MSE:	0.033051010221242905
Epoch	5	MSE:	0.028489310294389725
Epoch	6	MSE:	0.024737447500228882
Epoch	7	MSE:	0.022404339164495468
Epoch	8	MSE:	0.020453404635190964
Epoch	9	MSE:	0.017284277826547623
Epoch	10	MSE:	0.01122631411999464
Epoch	11	MSE:	0.002772070001810789
Epoch	12	MSE:	0.025505080819129944
Epoch	13	MSE:	0.0025287307798862457
Epoch	14	MSE:	0.003223186358809471
Epoch	15	MSE:	0.008347534574568272
Epoch	16	MSE:	0.010463183745741844
Epoch	17	MSE:	0.009586819447577
Epoch	18	MSE:	0.007009110413491726
Epoch	19	MSE:	0.004196471069008112
Epoch	20	MSE:	0.002506537828594446
Epoch	21	MSE:	0.0027336992789059877
Epoch	22	MSE:	0.004276775289326906
Epoch	23	MSE:	0.005116014275699854
Epoch	24	MSE:	0.003982208669185638
Epoch	25	MSE:	0.0018489181529730558
Epoch	26	MSE:	0.0004248559707775712
Epoch	27	MSE:	0.0004209510807413608
Epoch	28	MSE:	0.0013618790544569492
Epoch	29	MSE:	0.0022700177505612373
Epoch	30	MSE:	0.00243561714887619
Epoch	31	MSE:	0.0018296110210940242
Epoch	32	MSE:	0.0009753741323947906
Epoch	33	MSE:	0.00048026468721218407
Epoch	34	MSE:	0.0005769110866822302
Epoch	35	MSE:	0.0009738946100696921
Epoch	36	MSE:	0.0011721730697900057
Epoch	37	MSE:	0.0009679895592853427
Epoch	38	MSE:	0.0005756299360655248
Epoch	39	MSE:	0.00031497771851718426
Epoch	40	MSE:	0.0003196657926309854

Epoch 41 MSE: 0.0005070872139185667
Epoch 42 MSE: 0.000704207515809685
Epoch 43 MSE: 0.0007737756823189557
Epoch 44 MSE: 0.0006773490458726883
Epoch 45 MSE: 0.0004755813570227474
Epoch 46 MSE: 0.00028319910052232444
Epoch 47 MSE: 0.00019943130610045046
Epoch 48 MSE: 0.0002450211613904685
Epoch 49 MSE: 0.0003486427594907582
Epoch 50 MSE: 0.0004056979960296303
Epoch 51 MSE: 0.00036749590071849525
Epoch 52 MSE: 0.0002752554719336331
Epoch 53 MSE: 0.00020819748169742525
Epoch 54 MSE: 0.00020802089420612901
Epoch 55 MSE: 0.0002529455814510584
Epoch 56 MSE: 0.00028962548822164536
Epoch 57 MSE: 0.0002811622398439795
Epoch 58 MSE: 0.0002316344325663522
Epoch 59 MSE: 0.0001762215979397297
Epoch 60 MSE: 0.0001507862762082368
Epoch 61 MSE: 0.0001648826291784644
Epoch 62 MSE: 0.00019736927060876042
Epoch 63 MSE: 0.0002165812038583681
Epoch 64 MSE: 0.0002068586618406698
Epoch 65 MSE: 0.0001782803883543238
Epoch 66 MSE: 0.00015354788047261536
Epoch 67 MSE: 0.00014724383072461933
Epoch 68 MSE: 0.00015614062431268394
Epoch 69 MSE: 0.00016572153253946453
Epoch 70 MSE: 0.00016414849960710853
Epoch 71 MSE: 0.00015143907512538135
Epoch 72 MSE: 0.0001376225263811648
Epoch 73 MSE: 0.00013279738777782768
Epoch 74 MSE: 0.00013810672680847347
Epoch 75 MSE: 0.0001454928278690204
Epoch 76 MSE: 0.00014595576794818044
Epoch 77 MSE: 0.0001378853339701891
Epoch 78 MSE: 0.0001274741516681388
Epoch 79 MSE: 0.0001219045152538456
Epoch 80 MSE: 0.00012289703590795398
Epoch 81 MSE: 0.00012638041516765952
Epoch 82 MSE: 0.00012722429528366774
Epoch 83 MSE: 0.00012384251749608666
Epoch 84 MSE: 0.00011879372323164716
Epoch 85 MSE: 0.00011565864406293258
Epoch 86 MSE: 0.00011555750825209543
Epoch 87 MSE: 0.0001164903151220642
Epoch 88 MSE: 0.00011574193922569975

Epoch 89 MSE: 0.00011266471119597554
Epoch 90 MSE: 0.00010906199167948216
Epoch 91 MSE: 0.00010709855996537954
Epoch 92 MSE: 0.00010714538802858442
Epoch 93 MSE: 0.00010767691856017336
Epoch 94 MSE: 0.00010700178245315328
Epoch 95 MSE: 0.00010487296822248027
Epoch 96 MSE: 0.00010246042074868456
Epoch 97 MSE: 0.00010097625636262819
Epoch 98 MSE: 0.0001004978985292837
Epoch 99 MSE: 0.00010011578706325963
T-time: 114.4332389831543

=====
Train Score: 0.30 RMSE
=====
Validation Score: 6.77 RMSE
=====

=====
Time Step = 100 | Hidden States = 32 | Num Layers = 2
=====

Epoch 0 MSE: 0.04098782315850258
Epoch 1 MSE: 0.04290059208869934
Epoch 2 MSE: 0.036442894488573074
Epoch 3 MSE: 0.0331280343234539
Epoch 4 MSE: 0.03268846496939659
Epoch 5 MSE: 0.031057482585310936
Epoch 6 MSE: 0.026306288316845894
Epoch 7 MSE: 0.019328348338603973
Epoch 8 MSE: 0.013887966051697731
Epoch 9 MSE: 0.009003966115415096
Epoch 10 MSE: 0.0012328331358730793
Epoch 11 MSE: 0.01022490207105875
Epoch 12 MSE: 0.007071347441524267
Epoch 13 MSE: 0.00198581675067544
Epoch 14 MSE: 0.001956649124622345
Epoch 15 MSE: 0.0018859220435842872
Epoch 16 MSE: 0.003131464822217822
Epoch 17 MSE: 0.004039675462990999
Epoch 18 MSE: 0.003790466347709298
Epoch 19 MSE: 0.002522542607039213
Epoch 20 MSE: 0.0010272635845467448
Epoch 21 MSE: 0.0007319175638258457
Epoch 22 MSE: 0.0014505661092698574
Epoch 23 MSE: 0.001264269114471972
Epoch 24 MSE: 0.0014669690281152725

Epoch	25	MSE:	0.0018170725088566542
Epoch	26	MSE:	0.0013878023019060493
Epoch	27	MSE:	0.0005819277139380574
Epoch	28	MSE:	0.00035537168150767684
Epoch	29	MSE:	0.0007637825328856707
Epoch	30	MSE:	0.0009391079656779766
Epoch	31	MSE:	0.0007736757397651672
Epoch	32	MSE:	0.0007155466009862721
Epoch	33	MSE:	0.0007591740577481687
Epoch	34	MSE:	0.0006654232856817544
Epoch	35	MSE:	0.0004100064397789538
Epoch	36	MSE:	0.00026211427757516503
Epoch	37	MSE:	0.00043497595470398664
Epoch	38	MSE:	0.0006242632516659796
Epoch	39	MSE:	0.0004971547168679535
Epoch	40	MSE:	0.00032200218993239105
Epoch	41	MSE:	0.00031003530602902174
Epoch	42	MSE:	0.00033296082983724773
Epoch	43	MSE:	0.0002996637485921383
Epoch	44	MSE:	0.0002792877785395831
Epoch	45	MSE:	0.0003244302642997354
Epoch	46	MSE:	0.00034329656045883894
Epoch	47	MSE:	0.00025819247821345925
Epoch	48	MSE:	0.00017091778863687068
Epoch	49	MSE:	0.0001850099506555125
Epoch	50	MSE:	0.00024023013247642666
Epoch	51	MSE:	0.00024037256662268192
Epoch	52	MSE:	0.00019916730525437742
Epoch	53	MSE:	0.00018046483455691487
Epoch	54	MSE:	0.00017566421593073756
Epoch	55	MSE:	0.00015344523126259446
Epoch	56	MSE:	0.00014380928769242018
Epoch	57	MSE:	0.0001643252617213875
Epoch	58	MSE:	0.00017542358546052128
Epoch	59	MSE:	0.00015084365440998226
Epoch	60	MSE:	0.00012063344911439344
Epoch	61	MSE:	0.00012006692122668028
Epoch	62	MSE:	0.00013236081576906145
Epoch	63	MSE:	0.00012896247790195048
Epoch	64	MSE:	0.00012134990538470447
Epoch	65	MSE:	0.000119765245472081
Epoch	66	MSE:	0.00011171623191330582
Epoch	67	MSE:	9.978882007999346e-05
Epoch	68	MSE:	0.00010087693226523697
Epoch	69	MSE:	0.00010919192573055625
Epoch	70	MSE:	0.00010507577826501802
Epoch	71	MSE:	9.307213622378185e-05
Epoch	72	MSE:	8.93928954610601e-05

```

Epoch 73 MSE: 9.116641012951732e-05
Epoch 74 MSE: 8.921301923692226e-05
Epoch 75 MSE: 8.684850763529539e-05
Epoch 76 MSE: 8.659071318106726e-05
Epoch 77 MSE: 8.256512955995277e-05
Epoch 78 MSE: 7.697152614127845e-05
Epoch 79 MSE: 7.71156046539545e-05
Epoch 80 MSE: 7.91876227594912e-05
Epoch 81 MSE: 7.652526255697012e-05
Epoch 82 MSE: 7.222809654194862e-05
Epoch 83 MSE: 7.09464366082102e-05
Epoch 84 MSE: 7.034221198409796e-05
Epoch 85 MSE: 6.880534056108445e-05
Epoch 86 MSE: 6.817879329901189e-05
Epoch 87 MSE: 6.70961890136823e-05
Epoch 88 MSE: 6.425727042369545e-05
Epoch 89 MSE: 6.264723197091371e-05
Epoch 90 MSE: 6.30088834441267e-05
Epoch 91 MSE: 6.217448390088975e-05
Epoch 92 MSE: 6.006090552546084e-05
Epoch 93 MSE: 5.885513382963836e-05
Epoch 94 MSE: 5.807931302115321e-05
Epoch 95 MSE: 5.703369606635533e-05
Epoch 96 MSE: 5.644217526423745e-05
Epoch 97 MSE: 5.56419872737024e-05
Epoch 98 MSE: 5.408280048868619e-05
Epoch 99 MSE: 5.315728412824683e-05
T-time: 229.83534979820251

```

```

=====
Train Score: 0.22 RMSE
=====
Validation Score: 4.94 RMSE
=====

```

```
[35]: LSTM_results = pd.DataFrame(LSTM_results, columns=['time_step', 'num_layers', '
↳ 'hidden_dim', 'trainScore', 'valScore'], index = None)
```

```
[36]: LSTM_results = LSTM_results.sort_values('valScore', ascending=True,
↳ ignore_index = True)
LSTM_results
```

```
[36]:
```

	time_step	num_layers	hidden_dim	trainScore	valScore
0	20.0	2.0	32.0	0.183898	3.353715
1	30.0	2.0	32.0	0.191065	3.398010
2	50.0	2.0	32.0	0.210327	4.301537

3	100.0	2.0	16.0	0.190670	4.511294
4	50.0	2.0	16.0	0.191541	4.528789
5	100.0	2.0	32.0	0.217563	4.937522
6	50.0	1.0	16.0	0.183526	5.014984
7	30.0	1.0	16.0	0.185471	5.037486
8	100.0	1.0	16.0	0.183330	5.103107
9	20.0	1.0	16.0	0.189064	5.119752
10	30.0	2.0	16.0	0.199778	5.293988
11	30.0	1.0	8.0	0.250768	5.803946
12	50.0	1.0	8.0	0.250364	5.835172
13	20.0	1.0	8.0	0.252050	5.862777
14	100.0	1.0	8.0	0.250940	5.981001
15	20.0	1.0	32.0	0.248382	6.055101
16	20.0	2.0	16.0	0.209868	6.119395
17	30.0	1.0	32.0	0.273482	6.347491
18	50.0	1.0	32.0	0.294004	6.640990
19	100.0	1.0	32.0	0.298576	6.774301
20	50.0	1.0	4.0	0.483148	10.029259
21	30.0	1.0	4.0	0.490937	10.049406
22	100.0	1.0	4.0	0.481717	10.236452
23	20.0	1.0	4.0	0.508500	10.256740
24	50.0	2.0	8.0	0.332756	12.093705
25	30.0	2.0	8.0	0.328463	12.103140
26	100.0	2.0	8.0	0.334082	12.263771
27	20.0	2.0	8.0	0.378380	12.322964
28	30.0	2.0	2.0	0.592207	13.141265
29	50.0	2.0	2.0	0.589061	13.207722
30	20.0	2.0	2.0	0.620932	13.352711
31	100.0	2.0	2.0	0.592736	13.520443
32	30.0	2.0	4.0	0.866593	15.074994
33	50.0	2.0	4.0	0.861307	15.130204
34	20.0	2.0	4.0	0.877747	15.173122
35	100.0	2.0	4.0	0.864794	15.404663
36	20.0	1.0	2.0	1.473281	16.385214
37	30.0	1.0	2.0	1.397408	16.527496
38	50.0	1.0	2.0	1.359005	16.672426
39	100.0	1.0	2.0	1.340623	17.035766

0.13 Selecting Best Model (LSTM Model)

```
[37]: best_lstm_model = LSTM_results.iloc[0]
      best_lstm_model
```

```
[37]: time_step      20.000000
      num_layers      2.000000
      hidden_dim     32.000000
      trainScore      0.183898
```

```
valScore          3.353715
Name: 0, dtype: float64
```

```
[38]: input_dim = 1
      output_dim = 1
      num_epochs = 100
      lr = 0.01
      loss_type = torch.nn.MSELoss(reduction='mean')
      optimiser = torch.optim.Adam

      hidden_dim = int(best_lstm_model['hidden_dim'])
      num_layers = int(best_lstm_model['num_layers'])
      time_step = int(best_lstm_model['time_step'])

      torch.manual_seed(42)
      tuned_lstm = LSTM_model(input_dim = input_dim, hidden_dim = hidden_dim,
                               ↪output_dim = output_dim, layer_dim = num_layers)
      tuned_lstm = to_device(tuned_lstm, device)

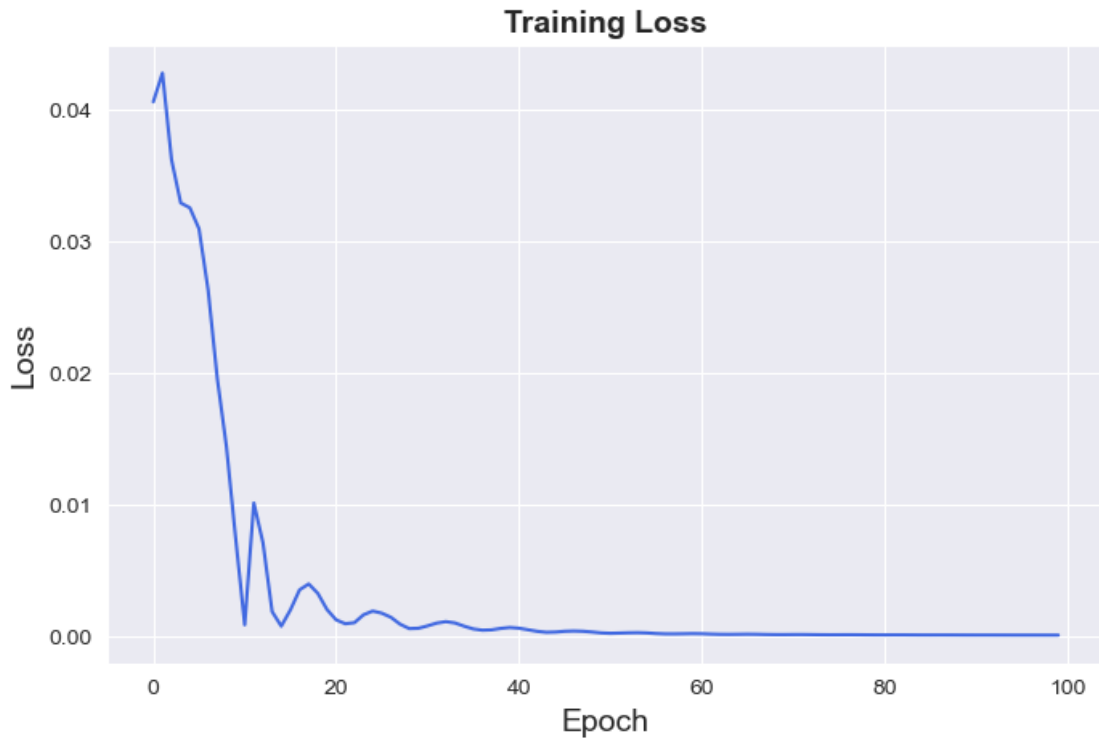
      evaluate_single_model(tuned_lstm, num_epochs, lr, loss_type, optimiser,
                               ↪time_step)
```

```
Epoch 0 MSE: 0.040618978440761566
Epoch 1 MSE: 0.04281147941946983
Epoch 2 MSE: 0.036195024847984314
Epoch 3 MSE: 0.03292616829276085
Epoch 4 MSE: 0.032557085156440735
Epoch 5 MSE: 0.030960144475102425
Epoch 6 MSE: 0.026295436546206474
Epoch 7 MSE: 0.019574686884880066
Epoch 8 MSE: 0.014389541931450367
Epoch 9 MSE: 0.007475757040083408
Epoch 10 MSE: 0.0008210205123759806
Epoch 11 MSE: 0.010090870782732964
Epoch 12 MSE: 0.0070607322268188
Epoch 13 MSE: 0.0018260730430483818
Epoch 14 MSE: 0.0007192532648332417
Epoch 15 MSE: 0.001957071479409933
Epoch 16 MSE: 0.0034813072998076677
Epoch 17 MSE: 0.0039337510243058205
Epoch 18 MSE: 0.0032134391367435455
Epoch 19 MSE: 0.0019866065122187138
Epoch 20 MSE: 0.0012014649109914899
Epoch 21 MSE: 0.0009045402985066175
Epoch 22 MSE: 0.000983517151325941
Epoch 23 MSE: 0.0015868934569880366
Epoch 24 MSE: 0.00186759268399328
Epoch 25 MSE: 0.0017075836658477783
```

Epoch	26	MSE:	0.0013904622755944729
Epoch	27	MSE:	0.0008669569506309927
Epoch	28	MSE:	0.0005355679895728827
Epoch	29	MSE:	0.0005577965057455003
Epoch	30	MSE:	0.0007416111184284091
Epoch	31	MSE:	0.000952484377194196
Epoch	32	MSE:	0.0010651820339262486
Epoch	33	MSE:	0.000964015256613493
Epoch	34	MSE:	0.0007188546005636454
Epoch	35	MSE:	0.000508075871039182
Epoch	36	MSE:	0.0004137598443776369
Epoch	37	MSE:	0.0004381434991955757
Epoch	38	MSE:	0.00054739456390962
Epoch	39	MSE:	0.0006173465517349541
Epoch	40	MSE:	0.0005628871149383485
Epoch	41	MSE:	0.00044543895637616515
Epoch	42	MSE:	0.00032515102066099644
Epoch	43	MSE:	0.0002531992504373193
Epoch	44	MSE:	0.0002722999488469213
Epoch	45	MSE:	0.0003296692157164216
Epoch	46	MSE:	0.00035123637644574046
Epoch	47	MSE:	0.00033084998722188175
Epoch	48	MSE:	0.00027451166533865035
Epoch	49	MSE:	0.00020464873523451388
Epoch	50	MSE:	0.00017633654351811856
Epoch	51	MSE:	0.0001937545748660341
Epoch	52	MSE:	0.00021363218547776341
Epoch	53	MSE:	0.00022324759629555047
Epoch	54	MSE:	0.00020291823602747172
Epoch	55	MSE:	0.00015792869089636952
Epoch	56	MSE:	0.00013213518832344562
Epoch	57	MSE:	0.00013046184903942049
Epoch	58	MSE:	0.00013931546709500253
Epoch	59	MSE:	0.00015011505456641316
Epoch	60	MSE:	0.00014165484753903002
Epoch	61	MSE:	0.00011667511716950685
Epoch	62	MSE:	9.995536674978212e-05
Epoch	63	MSE:	9.635627793613821e-05
Epoch	64	MSE:	0.00010215606016572565
Epoch	65	MSE:	0.00010930553253274411
Epoch	66	MSE:	0.0001021002244669944
Epoch	67	MSE:	8.75506448210217e-05
Epoch	68	MSE:	7.922462100395933e-05
Epoch	69	MSE:	7.783198816468939e-05
Epoch	70	MSE:	8.237096335506067e-05
Epoch	71	MSE:	8.350572170456871e-05
Epoch	72	MSE:	7.578958320664242e-05
Epoch	73	MSE:	6.776477675884962e-05

Epoch 74 MSE: 6.405951717169955e-05
Epoch 75 MSE: 6.484367622761056e-05
Epoch 76 MSE: 6.721611134707928e-05
Epoch 77 MSE: 6.424181628972292e-05
Epoch 78 MSE: 5.865002458449453e-05
Epoch 79 MSE: 5.511551717063412e-05
Epoch 80 MSE: 5.4543936130357906e-05
Epoch 81 MSE: 5.61417436983902e-05
Epoch 82 MSE: 5.509438778972253e-05
Epoch 83 MSE: 5.172540477360599e-05
Epoch 84 MSE: 4.908813934889622e-05
Epoch 85 MSE: 4.818529851036146e-05
Epoch 86 MSE: 4.9039434088626876e-05
Epoch 87 MSE: 4.837533560930751e-05
Epoch 88 MSE: 4.616101068677381e-05
Epoch 89 MSE: 4.4178199459565803e-05
Epoch 90 MSE: 4.345014167483896e-05
Epoch 91 MSE: 4.385017746244557e-05
Epoch 92 MSE: 4.3200554500799626e-05
Epoch 93 MSE: 4.1761846659937873e-05
Epoch 94 MSE: 4.043874650960788e-05
Epoch 95 MSE: 4.012057252111845e-05
Epoch 96 MSE: 4.0292685298481956e-05
Epoch 97 MSE: 3.9715570892440155e-05
Epoch 98 MSE: 3.875664697261527e-05
Epoch 99 MSE: 3.797909812419675e-05
T-time: 35.99087166786194

=====
Train Score: 0.18 RMSE
=====
Validation Score: 3.35 RMSE
=====



0.14 Model Architecture (GRU)

```
[39]: class GRU_model(nn.Module):
    def __init__(self, input_dim, hidden_dim, layer_dim, output_dim):
        super(GRU_model, self).__init__()
        self.hidden_dim = hidden_dim
        self.layer_dim = layer_dim

        self.gru = nn.GRU(input_dim, hidden_dim, layer_dim, batch_first=True)
        self.fc = nn.Linear(hidden_dim, output_dim)

    def forward(self, x):
        h0 = Variable(torch.zeros(self.layer_dim, x.size(0), self.hidden_dim,
        ↪device = device))
        out, (hn) = self.gru(x, (h0.detach()))
        out = self.fc(out[:, -1, :])
        return out
```

```
[40]: gc.collect()
torch.cuda.empty_cache()
```

0.15 GRU Model

```
[41]: input_dim = 1
      output_dim = 1
      num_epochs = 100
      lr = 0.01
      loss_type = torch.nn.MSELoss(reduction = 'mean')
      optimiser = torch.optim.Adam

      hidden_dim = int(best_lstm_model['hidden_dim'])
      num_layers = int(best_lstm_model['num_layers'])
      time_step = int(best_lstm_model['time_step'])

      torch.manual_seed(42)
      gru = GRU_model(input_dim = input_dim, hidden_dim = hidden_dim, output_dim =
        ↪output_dim, layer_dim = num_layers)
      gru = to_device(gru, device)

      evaluate_single_model(gru, num_epochs, lr, loss_type, optimiser, time_step)
```

```
Epoch 0 MSE: 0.07179559022188187
Epoch 1 MSE: 0.053293388336896896
Epoch 2 MSE: 0.04245859757065773
Epoch 3 MSE: 0.02891470678150654
Epoch 4 MSE: 0.028615588322281837
Epoch 5 MSE: 0.028290200978517532
Epoch 6 MSE: 0.020927928388118744
Epoch 7 MSE: 0.011481642723083496
Epoch 8 MSE: 0.008736717514693737
Epoch 9 MSE: 0.009971647523343563
Epoch 10 MSE: 0.002672072034329176
Epoch 11 MSE: 0.002599109197035432
Epoch 12 MSE: 0.009029964916408062
Epoch 13 MSE: 0.0048012034967541695
Epoch 14 MSE: 0.000365995365427807
Epoch 15 MSE: 0.0012147922534495592
Epoch 16 MSE: 0.0032251854427158833
Epoch 17 MSE: 0.003329699393361807
Epoch 18 MSE: 0.0024801664985716343
Epoch 19 MSE: 0.0020592212677001953
Epoch 20 MSE: 0.0021666716784238815
Epoch 21 MSE: 0.0021524960175156593
Epoch 22 MSE: 0.0015332387993112206
Epoch 23 MSE: 0.0005607558996416628
Epoch 24 MSE: 0.0001422767381882295
Epoch 25 MSE: 0.0008216415881179273
Epoch 26 MSE: 0.001618026290088892
Epoch 27 MSE: 0.001312705921009183
```

Epoch 28 MSE: 0.00048756232718005776
 Epoch 29 MSE: 0.00017417124763596803
 Epoch 30 MSE: 0.00037566316314041615
 Epoch 31 MSE: 0.0005903263227082789
 Epoch 32 MSE: 0.00057415192713961
 Epoch 33 MSE: 0.00044022814836353064
 Epoch 34 MSE: 0.0003897933929692954
 Epoch 35 MSE: 0.00045812551979906857
 Epoch 36 MSE: 0.000488189427414909
 Epoch 37 MSE: 0.0003477517166174948
 Epoch 38 MSE: 0.0001291118242079392
 Epoch 39 MSE: 4.772728789248504e-05
 Epoch 40 MSE: 0.00016554231115151197
 Epoch 41 MSE: 0.0003175752644892782
 Epoch 42 MSE: 0.0003260724770370871
 Epoch 43 MSE: 0.00020462312386371195
 Epoch 44 MSE: 0.00010212827328359708
 Epoch 45 MSE: 9.807762398850173e-05
 Epoch 46 MSE: 0.0001326723286183551
 Epoch 47 MSE: 0.00013018090976402164
 Epoch 48 MSE: 0.00010243273572996259
 Epoch 49 MSE: 0.00010117741476278752
 Epoch 50 MSE: 0.00013013722491450608
 Epoch 51 MSE: 0.0001431655400665477
 Epoch 52 MSE: 0.00010955549078062177
 Epoch 53 MSE: 5.572067675529979e-05
 Epoch 54 MSE: 3.4837958082789555e-05
 Epoch 55 MSE: 6.10963543294929e-05
 Epoch 56 MSE: 9.267429413739592e-05
 Epoch 57 MSE: 8.996023098006845e-05
 Epoch 58 MSE: 6.48604691377841e-05
 Epoch 59 MSE: 5.12432525283657e-05
 Epoch 60 MSE: 5.43672067578882e-05
 Epoch 61 MSE: 5.522068022401072e-05
 Epoch 62 MSE: 4.6621895307907835e-05
 Epoch 63 MSE: 4.1491861338727176e-05
 Epoch 64 MSE: 4.876060120295733e-05
 Epoch 65 MSE: 5.7778754126047716e-05
 Epoch 66 MSE: 5.371328006731346e-05
 Epoch 67 MSE: 3.9405083953170106e-05
 Epoch 68 MSE: 3.0961389711592346e-05
 Epoch 69 MSE: 3.514246054692194e-05
 Epoch 70 MSE: 4.230751801514998e-05
 Epoch 71 MSE: 4.2306124669266865e-05
 Epoch 72 MSE: 3.7418903957586735e-05
 Epoch 73 MSE: 3.515679782140069e-05
 Epoch 74 MSE: 3.5786368243861943e-05
 Epoch 75 MSE: 3.440362706896849e-05

Epoch 76 MSE: 3.100948015344329e-05
Epoch 77 MSE: 3.0363396945176646e-05
Epoch 78 MSE: 3.333540735184215e-05
Epoch 79 MSE: 3.516208380460739e-05
Epoch 80 MSE: 3.276917777839117e-05
Epoch 81 MSE: 2.9066435672575608e-05
Epoch 82 MSE: 2.8185382689116523e-05
Epoch 83 MSE: 2.968939588754438e-05
Epoch 84 MSE: 3.0328046705108136e-05
Epoch 85 MSE: 2.9376946258707903e-05
Epoch 86 MSE: 2.8730630219797604e-05
Epoch 87 MSE: 2.8911943445564248e-05
Epoch 88 MSE: 2.8512082280940376e-05
Epoch 89 MSE: 2.725705417105928e-05
Epoch 90 MSE: 2.6677844289224595e-05
Epoch 91 MSE: 2.7400868930271827e-05
Epoch 92 MSE: 2.802954077196773e-05
Epoch 93 MSE: 2.7431246053311042e-05
Epoch 94 MSE: 2.638915611896664e-05
Epoch 95 MSE: 2.6084591809194535e-05
Epoch 96 MSE: 2.6323717975174077e-05
Epoch 97 MSE: 2.6283149054506794e-05
Epoch 98 MSE: 2.5976780307246372e-05
Epoch 99 MSE: 2.5904790163622238e-05
T-time: 56.14676237106323

=====
Train Score: 0.15 RMSE
=====
Validation Score: 4.23 RMSE
=====



```
[42]: gc.collect()
      torch.cuda.empty_cache()
```

0.16 Hyper Parameters Tuning

```
[43]: input_dim = 1
      output_dim = 1
      num_epochs = 100
      lr = 0.01
      loss_type = torch.nn.MSELoss(reduction = 'mean')
      optimiser = torch.optim.Adam

      num_layers = [1, 2]
      sliding_windows = [20, 30, 50, 100]
      hidden_dims = [2, 4, 8, 16, 32]

      GRU_results=[]

      for time_step in sliding_windows:
          for hidden_dim in hidden_dims:
              for layers in num_layers:

                  gc.collect()
```

```

torch.cuda.empty_cache()

print("=====")
print("Time Step =", time_step, "| Hidden States =", hidden_dim, "| Num Layers =", layers)
print("=====")
print()

torch.manual_seed(42)
gru_exp = GRU_model(input_dim = input_dim, hidden_dim = hidden_dim,
    output_dim = output_dim, layer_dim = layers)
gru_exp = to_device(gru_exp, device)

GRU_res = evaluate_model_experiments(gru_exp, num_epochs, lr,
    loss_type, optimiser, time_step)
GRU_results += [GRU_res.iloc[0]]
print()

```

```

=====
Time Step = 20 | Hidden States = 2 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.07427381724119186
Epoch 1 MSE: 0.06199593096971512
Epoch 2 MSE: 0.052362293004989624
Epoch 3 MSE: 0.04557616263628006
Epoch 4 MSE: 0.04164762794971466
Epoch 5 MSE: 0.04021786153316498
Epoch 6 MSE: 0.040409237146377563
Epoch 7 MSE: 0.040988076478242874
Epoch 8 MSE: 0.04094001278281212
Epoch 9 MSE: 0.03987399488687515
Epoch 10 MSE: 0.03793422877788544
Epoch 11 MSE: 0.03552033379673958
Epoch 12 MSE: 0.03306340053677559
Epoch 13 MSE: 0.03089897148311138
Epoch 14 MSE: 0.029210686683654785
Epoch 15 MSE: 0.02802242711186409
Epoch 16 MSE: 0.02722751721739769
Epoch 17 MSE: 0.02664337493479252
Epoch 18 MSE: 0.026074957102537155
Epoch 19 MSE: 0.025368213653564453
Epoch 20 MSE: 0.024440977722406387
Epoch 21 MSE: 0.023288598284125328
Epoch 22 MSE: 0.021969566121697426
Epoch 23 MSE: 0.02057962864637375
Epoch 24 MSE: 0.019222039729356766

```

Epoch	25	MSE:	0.017980000004172325
Epoch	26	MSE:	0.016896188259124756
Epoch	27	MSE:	0.01596393994987011
Epoch	28	MSE:	0.015133019536733627
Epoch	29	MSE:	0.014329414814710617
Epoch	30	MSE:	0.013482862152159214
Epoch	31	MSE:	0.012551860883831978
Epoch	32	MSE:	0.011536533944308758
Epoch	33	MSE:	0.010475149378180504
Epoch	34	MSE:	0.009427042677998543
Epoch	35	MSE:	0.008449368178844452
Epoch	36	MSE:	0.007576439063996077
Epoch	37	MSE:	0.006808874197304249
Epoch	38	MSE:	0.0061164796352386475
Epoch	39	MSE:	0.005453894380480051
Epoch	40	MSE:	0.00478263758122921
Epoch	41	MSE:	0.004089698661118746
Epoch	42	MSE:	0.0033938074484467506
Epoch	43	MSE:	0.0027362515684217215
Epoch	44	MSE:	0.00216062949039042
Epoch	45	MSE:	0.001691576442681253
Epoch	46	MSE:	0.0013237284729257226
Epoch	47	MSE:	0.0010275529930368066
Epoch	48	MSE:	0.0007691361242905259
Epoch	49	MSE:	0.0005316450260579586
Epoch	50	MSE:	0.00032424204982817173
Epoch	51	MSE:	0.00017240027955267578
Epoch	52	MSE:	9.640928328735754e-05
Epoch	53	MSE:	9.336364746559411e-05
Epoch	54	MSE:	0.00013602017133962363
Epoch	55	MSE:	0.00018968460790347308
Epoch	56	MSE:	0.00023372108989860862
Epoch	57	MSE:	0.00027021983987651765
Epoch	58	MSE:	0.0003136376617476344
Epoch	59	MSE:	0.00037180280196480453
Epoch	60	MSE:	0.00043533139978535473
Epoch	61	MSE:	0.00048393019824288785
Epoch	62	MSE:	0.0005024914862588048
Epoch	63	MSE:	0.0004918229533359408
Epoch	64	MSE:	0.0004653285723179579
Epoch	65	MSE:	0.00043641813681460917
Epoch	66	MSE:	0.0004087611159775406
Epoch	67	MSE:	0.0003770762123167515
Epoch	68	MSE:	0.0003357111709192395
Epoch	69	MSE:	0.00028592508169822395
Epoch	70	MSE:	0.00023562849673908204
Epoch	71	MSE:	0.00019317348778713495
Epoch	72	MSE:	0.0001616086228750646

```

Epoch 73 MSE: 0.0001381462934659794
Epoch 74 MSE: 0.00011823291424661875
Epoch 75 MSE: 9.990417311200872e-05
Epoch 76 MSE: 8.478669042233378e-05
Epoch 77 MSE: 7.567019201815128e-05
Epoch 78 MSE: 7.342913886532187e-05
Epoch 79 MSE: 7.604226266266778e-05
Epoch 80 MSE: 8.016462379600853e-05
Epoch 81 MSE: 8.350540156243369e-05
Epoch 82 MSE: 8.592683298047632e-05
Epoch 83 MSE: 8.8622429757379e-05
Epoch 84 MSE: 9.242795931641012e-05
Epoch 85 MSE: 9.68316089711152e-05
Epoch 86 MSE: 0.00010038333130069077
Epoch 87 MSE: 0.00010190946341026574
Epoch 88 MSE: 0.00010136658238479868
Epoch 89 MSE: 9.96645976556465e-05
Epoch 90 MSE: 9.77692543528974e-05
Epoch 91 MSE: 9.59543467615731e-05
Epoch 92 MSE: 9.380844130646437e-05
Epoch 93 MSE: 9.085464262170717e-05
Epoch 94 MSE: 8.71349693625234e-05
Epoch 95 MSE: 8.323891961481422e-05
Epoch 96 MSE: 7.982892566360533e-05
Epoch 97 MSE: 7.715661195106804e-05
Epoch 98 MSE: 7.50015169614926e-05
Epoch 99 MSE: 7.302097947103903e-05
T-time: 7.868276357650757

```

```

=====
Train Score: 0.25 RMSE
=====
Validation Score: 7.23 RMSE
=====

```

```

=====
Time Step = 20 | Hidden States = 2 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.045359112322330475
Epoch 1 MSE: 0.039316803216934204
Epoch 2 MSE: 0.03677363321185112
Epoch 3 MSE: 0.036986544728279114
Epoch 4 MSE: 0.038217950612306595
Epoch 5 MSE: 0.0388665571808815
Epoch 6 MSE: 0.03855627775192261
Epoch 7 MSE: 0.03766573593020439
Epoch 8 MSE: 0.036702487617731094

```

Epoch 9 MSE: 0.03603684902191162
Epoch 10 MSE: 0.035816438496112823
Epoch 11 MSE: 0.03596315532922745
Epoch 12 MSE: 0.03624643012881279
Epoch 13 MSE: 0.03641818091273308
Epoch 14 MSE: 0.036337342113256454
Epoch 15 MSE: 0.0360105074942112
Epoch 16 MSE: 0.03554949909448624
Epoch 17 MSE: 0.035095442086458206
Epoch 18 MSE: 0.03475082665681839
Epoch 19 MSE: 0.03453965485095978
Epoch 20 MSE: 0.0344054140150547
Epoch 21 MSE: 0.034246426075696945
Epoch 22 MSE: 0.03397081047296524
Epoch 23 MSE: 0.03354085609316826
Epoch 24 MSE: 0.03298453614115715
Epoch 25 MSE: 0.03237337991595268
Epoch 26 MSE: 0.031780943274497986
Epoch 27 MSE: 0.03124014474451542
Epoch 28 MSE: 0.030720017850399017
Epoch 29 MSE: 0.03014206327497959
Epoch 30 MSE: 0.029434675350785255
Epoch 31 MSE: 0.028583258390426636
Epoch 32 MSE: 0.027634739875793457
Epoch 33 MSE: 0.026658780872821808
Epoch 34 MSE: 0.02569584734737873
Epoch 35 MSE: 0.02472626604139805
Epoch 36 MSE: 0.023686202242970467
Epoch 37 MSE: 0.02252454310655594
Epoch 38 MSE: 0.021250350400805473
Epoch 39 MSE: 0.019922493025660515
Epoch 40 MSE: 0.018588155508041382
Epoch 41 MSE: 0.01723315566778183
Epoch 42 MSE: 0.015812352299690247
Epoch 43 MSE: 0.014328480698168278
Epoch 44 MSE: 0.012849307619035244
Epoch 45 MSE: 0.011434501968324184
Epoch 46 MSE: 0.01006469689309597
Epoch 47 MSE: 0.008695329539477825
Epoch 48 MSE: 0.007367945741862059
Epoch 49 MSE: 0.006181653123348951
Epoch 50 MSE: 0.005161214619874954
Epoch 51 MSE: 0.004270038101822138
Epoch 52 MSE: 0.003549232380464673
Epoch 53 MSE: 0.0030483962036669254
Epoch 54 MSE: 0.002696921583265066
Epoch 55 MSE: 0.0024582487531006336
Epoch 56 MSE: 0.0023713998962193727

Epoch 57 MSE: 0.002362725790590048
 Epoch 58 MSE: 0.0023585420567542315
 Epoch 59 MSE: 0.0023586605675518513
 Epoch 60 MSE: 0.002313755452632904
 Epoch 61 MSE: 0.0021858953405171633
 Epoch 62 MSE: 0.0020013595931231976
 Epoch 63 MSE: 0.0017750668339431286
 Epoch 64 MSE: 0.0015156699810177088
 Epoch 65 MSE: 0.0012660635402426124
 Epoch 66 MSE: 0.001069521065801382
 Epoch 67 MSE: 0.0009378553950227797
 Epoch 68 MSE: 0.0008730322006158531
 Epoch 69 MSE: 0.0008755728485994041
 Epoch 70 MSE: 0.0009236691403202713
 Epoch 71 MSE: 0.0009811271447688341
 Epoch 72 MSE: 0.0010236420203000307
 Epoch 73 MSE: 0.00103769451379776
 Epoch 74 MSE: 0.0010133739560842514
 Epoch 75 MSE: 0.0009530010866001248
 Epoch 76 MSE: 0.000873230688739568
 Epoch 77 MSE: 0.0007918361807242036
 Epoch 78 MSE: 0.0007207508897408843
 Epoch 79 MSE: 0.0006698269280605018
 Epoch 80 MSE: 0.000644032668787986
 Epoch 81 MSE: 0.0006383350701071322
 Epoch 82 MSE: 0.0006440553697757423
 Epoch 83 MSE: 0.0006543242488987744
 Epoch 84 MSE: 0.0006608282565139234
 Epoch 85 MSE: 0.0006565372459590435
 Epoch 86 MSE: 0.0006409371853806078
 Epoch 87 MSE: 0.0006162203499116004
 Epoch 88 MSE: 0.0005852091126143932
 Epoch 89 MSE: 0.0005536253447644413
 Epoch 90 MSE: 0.0005266482476145029
 Epoch 91 MSE: 0.0005060643889009953
 Epoch 92 MSE: 0.0004926988622173667
 Epoch 93 MSE: 0.0004859081527683884
 Epoch 94 MSE: 0.0004823938070330769
 Epoch 95 MSE: 0.0004791116516571492
 Epoch 96 MSE: 0.0004741851589642465
 Epoch 97 MSE: 0.0004658664111047983
 Epoch 98 MSE: 0.0004539701039902866
 Epoch 99 MSE: 0.0004399411554913968
 T-time: 14.854719877243042

=====
 Train Score: 0.63 RMSE
 =====

Validation Score: 13.78 RMSE

=====

=====

Time Step = 20 | Hidden States = 4 | Num Layers = 1

=====

Epoch	0	MSE:	0.10166198760271072
Epoch	1	MSE:	0.07806313782930374
Epoch	2	MSE:	0.05883245915174484
Epoch	3	MSE:	0.04377719759941101
Epoch	4	MSE:	0.03265264630317688
Epoch	5	MSE:	0.025117725133895874
Epoch	6	MSE:	0.020722882822155952
Epoch	7	MSE:	0.018919575959444046
Epoch	8	MSE:	0.019068384543061256
Epoch	9	MSE:	0.020457273349165916
Epoch	10	MSE:	0.0223575159907341
Epoch	11	MSE:	0.024120664224028587
Epoch	12	MSE:	0.02527637593448162
Epoch	13	MSE:	0.025580625981092453
Epoch	14	MSE:	0.025000352412462234
Epoch	15	MSE:	0.02365824207663536
Epoch	16	MSE:	0.02176825702190399
Epoch	17	MSE:	0.019579490646719933
Epoch	18	MSE:	0.0173338633030653
Epoch	19	MSE:	0.01523686945438385
Epoch	20	MSE:	0.013439159840345383
Epoch	21	MSE:	0.012027110904455185
Epoch	22	MSE:	0.011021466925740242
Epoch	23	MSE:	0.01038355752825737
Epoch	24	MSE:	0.010028253309428692
Epoch	25	MSE:	0.009842008352279663
Epoch	26	MSE:	0.009703303687274456
Epoch	27	MSE:	0.009502442553639412
Epoch	28	MSE:	0.009157726541161537
Epoch	29	MSE:	0.008625898510217667
Epoch	30	MSE:	0.007905689999461174
Epoch	31	MSE:	0.0070346142165362835
Epoch	32	MSE:	0.006079884711652994
Epoch	33	MSE:	0.00512509373947978
Epoch	34	MSE:	0.004254325293004513
Epoch	35	MSE:	0.0035358506720513105
Epoch	36	MSE:	0.0030078254640102386
Epoch	37	MSE:	0.0026691833045333624
Epoch	38	MSE:	0.002479171846061945
Epoch	39	MSE:	0.002367986598983407
Epoch	40	MSE:	0.0022576460614800453

Epoch	41	MSE:	0.002087211702018976
Epoch	42	MSE:	0.0018327593570575118
Epoch	43	MSE:	0.0015134746208786964
Epoch	44	MSE:	0.0011813404271379113
Epoch	45	MSE:	0.0008991578943096101
Epoch	46	MSE:	0.0007161666289903224
Epoch	47	MSE:	0.0006506379577331245
Epoch	48	MSE:	0.0006853343802504241
Epoch	49	MSE:	0.0007764505571685731
Epoch	50	MSE:	0.0008714900468476117
Epoch	51	MSE:	0.0009284497937187552
Epoch	52	MSE:	0.00092888786457479
Epoch	53	MSE:	0.000880623294506222
Epoch	54	MSE:	0.000810269033536315
Epoch	55	MSE:	0.0007495417376048863
Epoch	56	MSE:	0.0007212022901512682
Epoch	57	MSE:	0.0007302173762582242
Epoch	58	MSE:	0.0007634639041498303
Epoch	59	MSE:	0.0007975375046953559
Epoch	60	MSE:	0.0008104608859866858
Epoch	61	MSE:	0.0007913341396488249
Epoch	62	MSE:	0.0007435626466758549
Epoch	63	MSE:	0.0006811103667132556
Epoch	64	MSE:	0.000620791397523135
Epoch	65	MSE:	0.0005748863914050162
Epoch	66	MSE:	0.0005472490447573364
Epoch	67	MSE:	0.0005337849725037813
Epoch	68	MSE:	0.0005260804900899529
Epoch	69	MSE:	0.0005159564898349345
Epoch	70	MSE:	0.0004988853470422328
Epoch	71	MSE:	0.0004751472733914852
Epoch	72	MSE:	0.0004487660771701485
Epoch	73	MSE:	0.0004251095524523407
Epoch	74	MSE:	0.00040837915730662644
Epoch	75	MSE:	0.0004000109329354018
Epoch	76	MSE:	0.0003984702634625137
Epoch	77	MSE:	0.0004002848581876606
Epoch	78	MSE:	0.0004016882448922843
Epoch	79	MSE:	0.0004000976332463324
Epoch	80	MSE:	0.00039485006709583104
Epoch	81	MSE:	0.0003870254149660468
Epoch	82	MSE:	0.0003785977605730295
Epoch	83	MSE:	0.00037139010964892805
Epoch	84	MSE:	0.0003663043607957661
Epoch	85	MSE:	0.00036308926064521074
Epoch	86	MSE:	0.00036064497544430196
Epoch	87	MSE:	0.0003576378512661904
Epoch	88	MSE:	0.0003531143011059612


```

Epoch 89 MSE: 0.00034685645368881524
Epoch 90 MSE: 0.0003393735096324235
Epoch 91 MSE: 0.0003315881476737559
Epoch 92 MSE: 0.00032440011273138225
Epoch 93 MSE: 0.000318326783599332
Epoch 94 MSE: 0.0003133659192826599
Epoch 95 MSE: 0.0003091025573667139
Epoch 96 MSE: 0.0003049775550607592
Epoch 97 MSE: 0.00030057146796025336
Epoch 98 MSE: 0.00029577489476650953
Epoch 99 MSE: 0.00029078577063046396
T-time: 7.513941287994385

```

```

=====
Train Score: 0.51 RMSE
=====

```

```

Validation Score: 11.72 RMSE
=====

```

```

=====
Time Step = 20 | Hidden States = 4 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.14354208111763
Epoch 1 MSE: 0.1094016283750534
Epoch 2 MSE: 0.08209074288606644
Epoch 3 MSE: 0.061887696385383606
Epoch 4 MSE: 0.04875456169247627
Epoch 5 MSE: 0.04232359305024147
Epoch 6 MSE: 0.04159177467226982
Epoch 7 MSE: 0.04451731964945793
Epoch 8 MSE: 0.04833493009209633
Epoch 9 MSE: 0.050794053822755814
Epoch 10 MSE: 0.05097775533795357
Epoch 11 MSE: 0.04909618943929672
Epoch 12 MSE: 0.045912984758615494
Epoch 13 MSE: 0.042290203273296356
Epoch 14 MSE: 0.03893335163593292
Epoch 15 MSE: 0.036288369446992874
Epoch 16 MSE: 0.03453632444143295
Epoch 17 MSE: 0.033642590045928955
Epoch 18 MSE: 0.03342723101377487
Epoch 19 MSE: 0.03363541141152382
Epoch 20 MSE: 0.03399727866053581
Epoch 21 MSE: 0.03427331522107124
Epoch 22 MSE: 0.03428471088409424
Epoch 23 MSE: 0.03392963483929634
Epoch 24 MSE: 0.03318701311945915

```

Epoch	25	MSE:	0.03210940212011337
Epoch	26	MSE:	0.03080698847770691
Epoch	27	MSE:	0.029424214735627174
Epoch	28	MSE:	0.028110815212130547
Epoch	29	MSE:	0.02698957547545433
Epoch	30	MSE:	0.026125628501176834
Epoch	31	MSE:	0.02550508826971054
Epoch	32	MSE:	0.02503308095037937
Epoch	33	MSE:	0.02455822192132473
Epoch	34	MSE:	0.023920834064483643
Epoch	35	MSE:	0.023008620366454124
Epoch	36	MSE:	0.021797023713588715
Epoch	37	MSE:	0.02035764791071415
Epoch	38	MSE:	0.018831858411431313
Epoch	39	MSE:	0.017378490418195724
Epoch	40	MSE:	0.016110775992274284
Epoch	41	MSE:	0.015041886828839779
Epoch	42	MSE:	0.014064633287489414
Epoch	43	MSE:	0.01299327053129673
Epoch	44	MSE:	0.011671879328787327
Epoch	45	MSE:	0.01009434461593628
Epoch	46	MSE:	0.008438142016530037
Epoch	47	MSE:	0.006958047393709421
Epoch	48	MSE:	0.005794252268970013
Epoch	49	MSE:	0.004849734250456095
Epoch	50	MSE:	0.0038935551419854164
Epoch	51	MSE:	0.0028395371045917273
Epoch	52	MSE:	0.0019038417376577854
Epoch	53	MSE:	0.0014064520364627242
Epoch	54	MSE:	0.0013286888133734465
Epoch	55	MSE:	0.0012476807460188866
Epoch	56	MSE:	0.001022628741338849
Epoch	57	MSE:	0.0010440998012199998
Epoch	58	MSE:	0.0014522321289405227
Epoch	59	MSE:	0.0017911741742864251
Epoch	60	MSE:	0.0018480918370187283
Epoch	61	MSE:	0.001967518124729395
Epoch	62	MSE:	0.002215736312791705
Epoch	63	MSE:	0.002222658833488822
Epoch	64	MSE:	0.00201100530102849
Epoch	65	MSE:	0.0018792476039379835
Epoch	66	MSE:	0.00178143463563174
Epoch	67	MSE:	0.0015429704217240214
Epoch	68	MSE:	0.001263863523490727
Epoch	69	MSE:	0.0011021568207070231
Epoch	70	MSE:	0.0010056104511022568
Epoch	71	MSE:	0.0008740611374378204
Epoch	72	MSE:	0.0007483737426809967

```

Epoch 73 MSE: 0.0007046855171211064
Epoch 74 MSE: 0.0007201741682365537
Epoch 75 MSE: 0.0007280966965481639
Epoch 76 MSE: 0.0007207093294709921
Epoch 77 MSE: 0.0007347110658884048
Epoch 78 MSE: 0.000776006723754108
Epoch 79 MSE: 0.0008094629156403244
Epoch 80 MSE: 0.0008131163194775581
Epoch 81 MSE: 0.0008035387727431953
Epoch 82 MSE: 0.00080142542719841
Epoch 83 MSE: 0.000799578323494643
Epoch 84 MSE: 0.0007792931282892823
Epoch 85 MSE: 0.0007420675246976316
Epoch 86 MSE: 0.0007067152764648199
Epoch 87 MSE: 0.0006810595514252782
Epoch 88 MSE: 0.0006545695359818637
Epoch 89 MSE: 0.0006206498364917934
Epoch 90 MSE: 0.0005893167108297348
Epoch 91 MSE: 0.0005705606890842319
Epoch 92 MSE: 0.0005591451190412045
Epoch 93 MSE: 0.0005460354732349515
Epoch 94 MSE: 0.0005339609924703836
Epoch 95 MSE: 0.0005300022894516587
Epoch 96 MSE: 0.0005310289561748505
Epoch 97 MSE: 0.0005288598476909101
Epoch 98 MSE: 0.0005237737204879522
Epoch 99 MSE: 0.0005210444796830416
T-time: 14.80426573753357

```

```

=====
Train Score: 0.68 RMSE
=====
Validation Score: 12.69 RMSE
=====

```

```

=====
Time Step = 20 | Hidden States = 8 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.21357010304927826
Epoch 1 MSE: 0.16476970911026
Epoch 2 MSE: 0.12439016997814178
Epoch 3 MSE: 0.09209439903497696
Epoch 4 MSE: 0.0675990954041481
Epoch 5 MSE: 0.05050116032361984
Epoch 6 MSE: 0.040242090821266174
Epoch 7 MSE: 0.03601611405611038
Epoch 8 MSE: 0.036574043333530426

```

Epoch 9 MSE: 0.040004193782806396
Epoch 10 MSE: 0.04396714270114899
Epoch 11 MSE: 0.04660268500447273
Epoch 12 MSE: 0.04711340740323067
Epoch 13 MSE: 0.0455918163061142
Epoch 14 MSE: 0.042598381638526917
Epoch 15 MSE: 0.03882305324077606
Epoch 16 MSE: 0.03488631546497345
Epoch 17 MSE: 0.031248940154910088
Epoch 18 MSE: 0.02819124609231949
Epoch 19 MSE: 0.025831513106822968
Epoch 20 MSE: 0.024162452667951584
Epoch 21 MSE: 0.023092053830623627
Epoch 22 MSE: 0.022480985149741173
Epoch 23 MSE: 0.022172782570123672
Epoch 24 MSE: 0.02201603539288044
Epoch 25 MSE: 0.02187914028763771
Epoch 26 MSE: 0.021658923476934433
Epoch 27 MSE: 0.02128439210355282
Epoch 28 MSE: 0.020716864615678787
Epoch 29 MSE: 0.019947415217757225
Epoch 30 MSE: 0.01899244450032711
Epoch 31 MSE: 0.01788805052638054
Epoch 32 MSE: 0.01668361946940422
Epoch 33 MSE: 0.015435146167874336
Epoch 34 MSE: 0.014198536984622478
Epoch 35 MSE: 0.013023347593843937
Epoch 36 MSE: 0.01194726675748825
Epoch 37 MSE: 0.0109918974339962
Epoch 38 MSE: 0.010160406120121479
Epoch 39 MSE: 0.009437615983188152
Epoch 40 MSE: 0.008793056942522526
Epoch 41 MSE: 0.008186914026737213
Epoch 42 MSE: 0.007578228134661913
Epoch 43 MSE: 0.006933859083801508
Epoch 44 MSE: 0.006236116401851177
Epoch 45 MSE: 0.00548703083768487
Epoch 46 MSE: 0.004707919899374247
Epoch 47 MSE: 0.003934202715754509
Epoch 48 MSE: 0.0032067543361335993
Epoch 49 MSE: 0.0025620823726058006
Epoch 50 MSE: 0.0020239041186869144
Epoch 51 MSE: 0.0015983176417648792
Epoch 52 MSE: 0.0012737925862893462
Epoch 53 MSE: 0.0010259362170472741
Epoch 54 MSE: 0.0008256698492914438
Epoch 55 MSE: 0.000648415822070092
Epoch 56 MSE: 0.0004814508429262787

Epoch 57 MSE: 0.00032696983544155955
Epoch 58 MSE: 0.00019958008488174528
Epoch 59 MSE: 0.00011873256153194234
Epoch 60 MSE: 9.856017277343199e-05
Epoch 61 MSE: 0.00013914768351241946
Epoch 62 MSE: 0.00022350013023242354
Epoch 63 MSE: 0.00032253231620416045
Epoch 64 MSE: 0.00040639538201503456
Epoch 65 MSE: 0.0004564113332889974
Epoch 66 MSE: 0.00047098571667447686
Epoch 67 MSE: 0.0004624681605491787
Epoch 68 MSE: 0.00044761024764738977
Epoch 69 MSE: 0.00043779032421298325
Epoch 70 MSE: 0.0004342893953435123
Epoch 71 MSE: 0.00043006223859265447
Epoch 72 MSE: 0.0004156184440944344
Epoch 73 MSE: 0.0003850734210573137
Epoch 74 MSE: 0.00033927688491530716
Epoch 75 MSE: 0.00028509259573183954
Epoch 76 MSE: 0.0002319329942110926
Epoch 77 MSE: 0.00018766960420180112
Epoch 78 MSE: 0.0001559013908263296
Epoch 79 MSE: 0.00013555301120504737
Epoch 80 MSE: 0.00012254375906195492
Epoch 81 MSE: 0.00011236253340030089
Epoch 82 MSE: 0.00010218763054581359
Epoch 83 MSE: 9.16842618607916e-05
Epoch 84 MSE: 8.241654722951353e-05
Epoch 85 MSE: 7.647716847714037e-05
Epoch 86 MSE: 7.515507604693994e-05
Epoch 87 MSE: 7.824917702237144e-05
Epoch 88 MSE: 8.419922960456461e-05
Epoch 89 MSE: 9.080717427423224e-05
Epoch 90 MSE: 9.611817222321406e-05
Epoch 91 MSE: 9.905851038638502e-05
Epoch 92 MSE: 9.961108298739418e-05
Epoch 93 MSE: 9.854306699708104e-05
Epoch 94 MSE: 9.688025602372363e-05
Epoch 95 MSE: 9.539252641843632e-05
Epoch 96 MSE: 9.430580394109711e-05
Epoch 97 MSE: 9.332597983302549e-05
Epoch 98 MSE: 9.191109711537138e-05
Epoch 99 MSE: 8.962277206592262e-05
T-time: 9.294182538986206

=====
Train Score: 0.28 RMSE
=====

Validation Score: 6.56 RMSE

=====

=====

Time Step = 20 | Hidden States = 8 | Num Layers = 2

=====

Epoch	0	MSE:	0.03697124868631363
Epoch	1	MSE:	0.03310519829392433
Epoch	2	MSE:	0.03370271250605583
Epoch	3	MSE:	0.0292363204061985
Epoch	4	MSE:	0.026478365063667297
Epoch	5	MSE:	0.02623298391699791
Epoch	6	MSE:	0.02466888353228569
Epoch	7	MSE:	0.020860018208622932
Epoch	8	MSE:	0.017303481698036194
Epoch	9	MSE:	0.01545956265181303
Epoch	10	MSE:	0.01325792446732521
Epoch	11	MSE:	0.009229110553860664
Epoch	12	MSE:	0.005698396358639002
Epoch	13	MSE:	0.004287221468985081
Epoch	14	MSE:	0.0022116259206086397
Epoch	15	MSE:	0.00017716115689836442
Epoch	16	MSE:	0.0017980221891775727
Epoch	17	MSE:	0.0022097118198871613
Epoch	18	MSE:	0.003261921927332878
Epoch	19	MSE:	0.0048162611201405525
Epoch	20	MSE:	0.003567339386790991
Epoch	21	MSE:	0.0032535989303141832
Epoch	22	MSE:	0.0023133631329983473
Epoch	23	MSE:	0.0008471875335089862
Epoch	24	MSE:	0.000561899330932647
Epoch	25	MSE:	0.0005047200829721987
Epoch	26	MSE:	0.00027102173771709204
Epoch	27	MSE:	0.0004863405483774841
Epoch	28	MSE:	0.0009667814010754228
Epoch	29	MSE:	0.001148776151239872
Epoch	30	MSE:	0.0011245205532759428
Epoch	31	MSE:	0.0012109491508454084
Epoch	32	MSE:	0.0012875939719378948
Epoch	33	MSE:	0.0011082090204581618
Epoch	34	MSE:	0.0008059577667154372
Epoch	35	MSE:	0.0006329651223495603
Epoch	36	MSE:	0.0005119871348142624
Epoch	37	MSE:	0.0002885629655793309
Epoch	38	MSE:	0.00012694988981820643
Epoch	39	MSE:	0.0001676496467553079
Epoch	40	MSE:	0.0002222883194917813

Epoch 41 MSE: 0.0002260654146084562
 Epoch 42 MSE: 0.0003318098606541753
 Epoch 43 MSE: 0.0004344201006460935
 Epoch 44 MSE: 0.00039851164910942316
 Epoch 45 MSE: 0.0003646730328910053
 Epoch 46 MSE: 0.0003434359678067267
 Epoch 47 MSE: 0.00024028825282584876
 Epoch 48 MSE: 0.00015548683586530387
 Epoch 49 MSE: 0.00014135798846837133
 Epoch 50 MSE: 0.00011559011181816459
 Epoch 51 MSE: 9.758918167790398e-05
 Epoch 52 MSE: 0.00013356999261304736
 Epoch 53 MSE: 0.0001659326662775129
 Epoch 54 MSE: 0.00016821706958580762
 Epoch 55 MSE: 0.00018074281979352236
 Epoch 56 MSE: 0.0001909102575154975
 Epoch 57 MSE: 0.00016751013754401356
 Epoch 58 MSE: 0.0001406693336321041
 Epoch 59 MSE: 0.0001283565943595022
 Epoch 60 MSE: 0.00010625593131408095
 Epoch 61 MSE: 8.563076698919758e-05
 Epoch 62 MSE: 8.831775630824268e-05
 Epoch 63 MSE: 9.250492439605296e-05
 Epoch 64 MSE: 9.264267282560468e-05
 Epoch 65 MSE: 0.00010458280303282663
 Epoch 66 MSE: 0.00011160228314111009
 Epoch 67 MSE: 0.00010620127432048321
 Epoch 68 MSE: 0.00010424284846521914
 Epoch 69 MSE: 9.851909271674231e-05
 Epoch 70 MSE: 8.588974014855921e-05
 Epoch 71 MSE: 8.046526636462659e-05
 Epoch 72 MSE: 7.784190529491752e-05
 Epoch 73 MSE: 7.367717626038939e-05
 Epoch 74 MSE: 7.590307359350845e-05
 Epoch 75 MSE: 7.952110900077969e-05
 Epoch 76 MSE: 7.933591405162588e-05
 Epoch 77 MSE: 8.0687808804214e-05
 Epoch 78 MSE: 8.081377018243074e-05
 Epoch 79 MSE: 7.678500696783885e-05
 Epoch 80 MSE: 7.397957961075008e-05
 Epoch 81 MSE: 7.153808837756515e-05
 Epoch 82 MSE: 6.778415263397619e-05
 Epoch 83 MSE: 6.67253989377059e-05
 Epoch 84 MSE: 6.68322536512278e-05
 Epoch 85 MSE: 6.619439227506518e-05
 Epoch 86 MSE: 6.70701265335083e-05
 Epoch 87 MSE: 6.742119148839265e-05
 Epoch 88 MSE: 6.625705282203853e-05

```

Epoch 89 MSE: 6.558900349773467e-05
Epoch 90 MSE: 6.409321213141084e-05
Epoch 91 MSE: 6.208506965776905e-05
Epoch 92 MSE: 6.11495051998645e-05
Epoch 93 MSE: 6.0092545027146116e-05
Epoch 94 MSE: 5.93443910474889e-05
Epoch 95 MSE: 5.941394192632288e-05
Epoch 96 MSE: 5.904004137846641e-05
Epoch 97 MSE: 5.866582796443254e-05
Epoch 98 MSE: 5.835271440446377e-05
Epoch 99 MSE: 5.739877087762579e-05
T-time: 17.47054648399353

```

```

=====
Train Score: 0.23 RMSE
=====
Validation Score: 6.10 RMSE
=====

```

```

=====
Time Step = 20 | Hidden States = 16 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.06648924201726913
Epoch 1 MSE: 0.04395616799592972
Epoch 2 MSE: 0.03344652056694031
Epoch 3 MSE: 0.033223707228899
Epoch 4 MSE: 0.035296231508255005
Epoch 5 MSE: 0.033633045852184296
Epoch 6 MSE: 0.029451798647642136
Epoch 7 MSE: 0.025384046137332916
Epoch 8 MSE: 0.022762421518564224
Epoch 9 MSE: 0.021611005067825317
Epoch 10 MSE: 0.021197443827986717
Epoch 11 MSE: 0.02060309424996376
Epoch 12 MSE: 0.01924586296081543
Epoch 13 MSE: 0.0171081330627203
Epoch 14 MSE: 0.014598134905099869
Epoch 15 MSE: 0.012272704392671585
Epoch 16 MSE: 0.01055016741156578
Epoch 17 MSE: 0.009449181146919727
Epoch 18 MSE: 0.00850654672831297
Epoch 19 MSE: 0.0071274940855801105
Epoch 20 MSE: 0.005141337867826223
Epoch 21 MSE: 0.002995114540681243
Epoch 22 MSE: 0.001472181174904108
Epoch 23 MSE: 0.0010693584335967898
Epoch 24 MSE: 0.0013061255449429154

```


Epoch	25	MSE:	0.0011848757276311517
Epoch	26	MSE:	0.0008524227887392044
Epoch	27	MSE:	0.0013726659817621112
Epoch	28	MSE:	0.0025197607465088367
Epoch	29	MSE:	0.0027213995344936848
Epoch	30	MSE:	0.0019265215378254652
Epoch	31	MSE:	0.0012608575634658337
Epoch	32	MSE:	0.001071047387085855
Epoch	33	MSE:	0.0009050466469489038
Epoch	34	MSE:	0.0005379050853662193
Epoch	35	MSE:	0.00018235128663945943
Epoch	36	MSE:	6.970119284233078e-05
Epoch	37	MSE:	0.00019274164515081793
Epoch	38	MSE:	0.00037587815313600004
Epoch	39	MSE:	0.0004723197198472917
Epoch	40	MSE:	0.000467958947410807
Epoch	41	MSE:	0.0004378685844130814
Epoch	42	MSE:	0.00044640814303420484
Epoch	43	MSE:	0.000490716309286654
Epoch	44	MSE:	0.0005179885774850845
Epoch	45	MSE:	0.0004826568183489144
Epoch	46	MSE:	0.00038801247137598693
Epoch	47	MSE:	0.00028030649991706014
Epoch	48	MSE:	0.0002065077133011073
Epoch	49	MSE:	0.00017574962112121284
Epoch	50	MSE:	0.0001593558699823916
Epoch	51	MSE:	0.00012760733079630882
Epoch	52	MSE:	8.361668005818501e-05
Epoch	53	MSE:	5.759382474934682e-05
Epoch	54	MSE:	6.976453005336225e-05
Epoch	55	MSE:	0.00010585397103568539
Epoch	56	MSE:	0.0001330512313870713
Epoch	57	MSE:	0.00013552367454394698
Epoch	58	MSE:	0.00012646069808397442
Epoch	59	MSE:	0.00012534877168945968
Epoch	60	MSE:	0.00013227768067736179
Epoch	61	MSE:	0.00013091650907881558
Epoch	62	MSE:	0.00011225107300560921
Epoch	63	MSE:	8.625470945844427e-05
Epoch	64	MSE:	6.88745712977834e-05
Epoch	65	MSE:	6.427834159694612e-05
Epoch	66	MSE:	6.395452510332689e-05
Epoch	67	MSE:	5.988231714582071e-05
Epoch	68	MSE:	5.3604224376613274e-05
Epoch	69	MSE:	5.196978599997237e-05
Epoch	70	MSE:	5.738906475016847e-05
Epoch	71	MSE:	6.489389488706365e-05
Epoch	72	MSE:	6.81945457472466e-05

```

Epoch 73 MSE: 6.63202881696634e-05
Epoch 74 MSE: 6.324027344817296e-05
Epoch 75 MSE: 6.21814324404113e-05
Epoch 76 MSE: 6.208828563103452e-05
Epoch 77 MSE: 5.9895304730162024e-05
Epoch 78 MSE: 5.4928190365899354e-05
Epoch 79 MSE: 4.982583413948305e-05
Epoch 80 MSE: 4.7301673475885764e-05
Epoch 81 MSE: 4.716640614788048e-05
Epoch 82 MSE: 4.719466232927516e-05
Epoch 83 MSE: 4.624006760423072e-05
Epoch 84 MSE: 4.5380875235423446e-05
Epoch 85 MSE: 4.594510392053053e-05
Epoch 86 MSE: 4.746209015138447e-05
Epoch 87 MSE: 4.827204975299537e-05
Epoch 88 MSE: 4.7651810746174306e-05
Epoch 89 MSE: 4.6471937821479514e-05
Epoch 90 MSE: 4.576073115458712e-05
Epoch 91 MSE: 4.539205110631883e-05
Epoch 92 MSE: 4.458713374333456e-05
Epoch 93 MSE: 4.3223695683991536e-05
Epoch 94 MSE: 4.2031551856780425e-05
Epoch 95 MSE: 4.1577848605811596e-05
Epoch 96 MSE: 4.1596889786887914e-05
Epoch 97 MSE: 4.149624874116853e-05
Epoch 98 MSE: 4.11616092605982e-05
Epoch 99 MSE: 4.094864925718866e-05
T-time: 13.776725769042969

```

```

=====
Train Score: 0.19 RMSE
=====
Validation Score: 4.30 RMSE
=====

```

```

=====
Time Step = 20 | Hidden States = 16 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.12328866869211197
Epoch 1 MSE: 0.06399630755186081
Epoch 2 MSE: 0.03484782576560974
Epoch 3 MSE: 0.034026168286800385
Epoch 4 MSE: 0.04490096867084503
Epoch 5 MSE: 0.04332171753048897
Epoch 6 MSE: 0.03539249673485756
Epoch 7 MSE: 0.029287295415997505
Epoch 8 MSE: 0.02712470293045044

```

Epoch 9 MSE: 0.0275803841650486
 Epoch 10 MSE: 0.028538474813103676
 Epoch 11 MSE: 0.028441565111279488
 Epoch 12 MSE: 0.02676238678395748
 Epoch 13 MSE: 0.02377472072839737
 Epoch 14 MSE: 0.02014775015413761
 Epoch 15 MSE: 0.016654236242175102
 Epoch 16 MSE: 0.013944784179329872
 Epoch 17 MSE: 0.012207362800836563
 Epoch 18 MSE: 0.010729984380304813
 Epoch 19 MSE: 0.008195501752197742
 Epoch 20 MSE: 0.004250070545822382
 Epoch 21 MSE: 0.0007388817030005157
 Epoch 22 MSE: 0.0009408073965460062
 Epoch 23 MSE: 0.004700010176748037
 Epoch 24 MSE: 0.005593719892203808
 Epoch 25 MSE: 0.003732556477189064
 Epoch 26 MSE: 0.0026981825940310955
 Epoch 27 MSE: 0.0024409431498497725
 Epoch 28 MSE: 0.0015879969578236341
 Epoch 29 MSE: 0.0006066819187253714
 Epoch 30 MSE: 0.00036019826075062156
 Epoch 31 MSE: 0.0008541498682461679
 Epoch 32 MSE: 0.0015538420993834734
 Epoch 33 MSE: 0.0019754308741539717
 Epoch 34 MSE: 0.0019425315549597144
 Epoch 35 MSE: 0.0015671401051804423
 Epoch 36 MSE: 0.0011091757332906127
 Epoch 37 MSE: 0.0008007483556866646
 Epoch 38 MSE: 0.0007004154613241553
 Epoch 39 MSE: 0.0006713524926453829
 Epoch 40 MSE: 0.0005402854876592755
 Epoch 41 MSE: 0.00030795394559390843
 Epoch 42 MSE: 0.00016091442375909537
 Epoch 43 MSE: 0.000248368683969602
 Epoch 44 MSE: 0.0004915003664791584
 Epoch 45 MSE: 0.0006583323702216148
 Epoch 46 MSE: 0.0006081382744014263
 Epoch 47 MSE: 0.0004141439567320049
 Epoch 48 MSE: 0.0002494911605026573
 Epoch 49 MSE: 0.0002004373091040179
 Epoch 50 MSE: 0.00021473260130733252
 Epoch 51 MSE: 0.00020631070947274566
 Epoch 52 MSE: 0.00016185565618798137
 Epoch 53 MSE: 0.00013252045027911663
 Epoch 54 MSE: 0.0001563814003020525
 Epoch 55 MSE: 0.00021500677394215018
 Epoch 56 MSE: 0.000256413099123165

Epoch 57 MSE: 0.00024483268498443067
Epoch 58 MSE: 0.00018862156139221042
Epoch 59 MSE: 0.00012792962661478668
Epoch 60 MSE: 9.758980013430119e-05
Epoch 61 MSE: 9.902477904688567e-05
Epoch 62 MSE: 0.00010683561413316056
Epoch 63 MSE: 0.00010148681758437306
Epoch 64 MSE: 8.9943379862234e-05
Epoch 65 MSE: 9.106417564908043e-05
Epoch 66 MSE: 0.00010760197619674727
Epoch 67 MSE: 0.00012134708958910778
Epoch 68 MSE: 0.00011499293032102287
Epoch 69 MSE: 9.161710477201268e-05
Epoch 70 MSE: 6.97197683621198e-05
Epoch 71 MSE: 6.270501762628555e-05
Epoch 72 MSE: 6.73644826747477e-05
Epoch 73 MSE: 7.188742165453732e-05
Epoch 74 MSE: 7.055910100461915e-05
Epoch 75 MSE: 6.75546980346553e-05
Epoch 76 MSE: 6.844197196187451e-05
Epoch 77 MSE: 7.216592348413542e-05
Epoch 78 MSE: 7.27096339687705e-05
Epoch 79 MSE: 6.677494093310088e-05
Epoch 80 MSE: 5.781524669146165e-05
Epoch 81 MSE: 5.2183913794578984e-05
Epoch 82 MSE: 5.2365907322382554e-05
Epoch 83 MSE: 5.512389907380566e-05
Epoch 84 MSE: 5.612011955236085e-05
Epoch 85 MSE: 5.4768112022429705e-05
Epoch 86 MSE: 5.3544856200460345e-05
Epoch 87 MSE: 5.37367413926404e-05
Epoch 88 MSE: 5.375296314014122e-05
Epoch 89 MSE: 5.1734015869442374e-05
Epoch 90 MSE: 4.8332763981306925e-05
Epoch 91 MSE: 4.5976979890838265e-05
Epoch 92 MSE: 4.5928794861538336e-05
Epoch 93 MSE: 4.7033241571625695e-05
Epoch 94 MSE: 4.7422407078556716e-05
Epoch 95 MSE: 4.6652177843498066e-05
Epoch 96 MSE: 4.567488576867618e-05
Epoch 97 MSE: 4.5193090045358986e-05
Epoch 98 MSE: 4.4806089135818183e-05
Epoch 99 MSE: 4.385584907140583e-05
T-time: 26.54852604866028

=====
Train Score: 0.20 RMSE
=====

Validation Score: 7.04 RMSE

=====

=====

Time Step = 20 | Hidden States = 32 | Num Layers = 1

=====

Epoch	0	MSE:	0.04279480129480362
Epoch	1	MSE:	0.032703205943107605
Epoch	2	MSE:	0.031237922608852386
Epoch	3	MSE:	0.025011612102389336
Epoch	4	MSE:	0.01927153766155243
Epoch	5	MSE:	0.01604052074253559
Epoch	6	MSE:	0.012436950579285622
Epoch	7	MSE:	0.0062834289856255054
Epoch	8	MSE:	0.0013593488838523626
Epoch	9	MSE:	0.0052099390886723995
Epoch	10	MSE:	0.003260774305090308
Epoch	11	MSE:	0.003612510859966278
Epoch	12	MSE:	0.00378512404859066
Epoch	13	MSE:	0.0012045865878462791
Epoch	14	MSE:	0.00010926204413408414
Epoch	15	MSE:	0.00119888037443161
Epoch	16	MSE:	0.0022847005166113377
Epoch	17	MSE:	0.002110561588779092
Epoch	18	MSE:	0.0013339685974642634
Epoch	19	MSE:	0.0009307835716754198
Epoch	20	MSE:	0.00108481349889189
Epoch	21	MSE:	0.001269939704798162
Epoch	22	MSE:	0.000993218389339745
Epoch	23	MSE:	0.00038003726513125
Epoch	24	MSE:	2.4624123398098163e-05
Epoch	25	MSE:	0.00026815923047252
Epoch	26	MSE:	0.000700667267665267
Epoch	27	MSE:	0.0007111811428330839
Epoch	28	MSE:	0.00039310866850428283
Epoch	29	MSE:	0.00025513788568787277
Epoch	30	MSE:	0.0003791103372350335
Epoch	31	MSE:	0.00043431652011349797
Epoch	32	MSE:	0.00026578549295663834
Epoch	33	MSE:	6.483187462436035e-05
Epoch	34	MSE:	4.7132110921666026e-05
Epoch	35	MSE:	0.00018599371833261102
Epoch	36	MSE:	0.0002905841392930597
Epoch	37	MSE:	0.00025535887107253075
Epoch	38	MSE:	0.00015428276674356312
Epoch	39	MSE:	0.00011016528151230887
Epoch	40	MSE:	0.0001424529473297298

Epoch 41 MSE: 0.00016796689305920154
Epoch 42 MSE: 0.0001232336653629318
Epoch 43 MSE: 4.661830098484643e-05
Epoch 44 MSE: 2.3317286832025275e-05
Epoch 45 MSE: 7.015690789557993e-05
Epoch 46 MSE: 0.00011570535571081564
Epoch 47 MSE: 0.00010303064482286572
Epoch 48 MSE: 6.230948929442093e-05
Epoch 49 MSE: 5.1163002353860065e-05
Epoch 50 MSE: 6.891697557875887e-05
Epoch 51 MSE: 7.16801660018973e-05
Epoch 52 MSE: 4.535085099632852e-05
Epoch 53 MSE: 2.1967240172671154e-05
Epoch 54 MSE: 2.837402280420065e-05
Epoch 55 MSE: 5.010570748709142e-05
Epoch 56 MSE: 5.666236029355787e-05
Epoch 57 MSE: 4.360254024504684e-05
Epoch 58 MSE: 3.209470014553517e-05
Epoch 59 MSE: 3.47589302691631e-05
Epoch 60 MSE: 4.0383813029620796e-05
Epoch 61 MSE: 3.4862114262068644e-05
Epoch 62 MSE: 2.3096949007594958e-05
Epoch 63 MSE: 2.022347143793013e-05
Epoch 64 MSE: 2.817891800077632e-05
Epoch 65 MSE: 3.3935270039364696e-05
Epoch 66 MSE: 3.0142373361741193e-05
Epoch 67 MSE: 2.4385670258197933e-05
Epoch 68 MSE: 2.4670569473528303e-05
Epoch 69 MSE: 2.7331045203027315e-05
Epoch 70 MSE: 2.5384544642292894e-05
Epoch 71 MSE: 2.0527286324067973e-05
Epoch 72 MSE: 1.9459863324300386e-05
Epoch 73 MSE: 2.2802531020715833e-05
Epoch 74 MSE: 2.4888426196412183e-05
Epoch 75 MSE: 2.3081649487721734e-05
Epoch 76 MSE: 2.0882391254417598e-05
Epoch 77 MSE: 2.1242591174086556e-05
Epoch 78 MSE: 2.2167767383507453e-05
Epoch 79 MSE: 2.0994846636313014e-05
Epoch 80 MSE: 1.9056094970437698e-05
Epoch 81 MSE: 1.9101604266325012e-05
Epoch 82 MSE: 2.061637678707484e-05
Epoch 83 MSE: 2.0996607418055646e-05
Epoch 84 MSE: 1.9923052605008706e-05
Epoch 85 MSE: 1.9324330423842184e-05
Epoch 86 MSE: 1.9752549633267336e-05
Epoch 87 MSE: 1.9804654584731907e-05
Epoch 88 MSE: 1.8968890799442306e-05

```

Epoch 89 MSE: 1.8457771147950552e-05
Epoch 90 MSE: 1.8919534340966493e-05
Epoch 91 MSE: 1.9397410142119043e-05
Epoch 92 MSE: 1.9118115233140998e-05
Epoch 93 MSE: 1.8666358300833963e-05
Epoch 94 MSE: 1.870349660748616e-05
Epoch 95 MSE: 1.884495941339992e-05
Epoch 96 MSE: 1.8570235624792986e-05
Epoch 97 MSE: 1.821903424570337e-05
Epoch 98 MSE: 1.8294214896741323e-05
Epoch 99 MSE: 1.8544651538832113e-05
T-time: 26.019545316696167

```

```

=====
Train Score: 0.13 RMSE
=====
Validation Score: 1.51 RMSE
=====

```

```

=====
Time Step = 20 | Hidden States = 32 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.07179559022188187
Epoch 1 MSE: 0.053293388336896896
Epoch 2 MSE: 0.04245859757065773
Epoch 3 MSE: 0.02891470678150654
Epoch 4 MSE: 0.028615588322281837
Epoch 5 MSE: 0.028290200978517532
Epoch 6 MSE: 0.020927928388118744
Epoch 7 MSE: 0.011481642723083496
Epoch 8 MSE: 0.008736717514693737
Epoch 9 MSE: 0.009971647523343563
Epoch 10 MSE: 0.002672072034329176
Epoch 11 MSE: 0.002599109197035432
Epoch 12 MSE: 0.009029964916408062
Epoch 13 MSE: 0.0048012034967541695
Epoch 14 MSE: 0.000365995365427807
Epoch 15 MSE: 0.0012147922534495592
Epoch 16 MSE: 0.0032251854427158833
Epoch 17 MSE: 0.003329699393361807
Epoch 18 MSE: 0.0024801664985716343
Epoch 19 MSE: 0.0020592212677001953
Epoch 20 MSE: 0.0021666716784238815
Epoch 21 MSE: 0.0021524960175156593
Epoch 22 MSE: 0.0015332387993112206
Epoch 23 MSE: 0.0005607558996416628
Epoch 24 MSE: 0.0001422767381882295

```

Epoch 25 MSE: 0.0008216415881179273
 Epoch 26 MSE: 0.001618026290088892
 Epoch 27 MSE: 0.001312705921009183
 Epoch 28 MSE: 0.00048756232718005776
 Epoch 29 MSE: 0.00017417124763596803
 Epoch 30 MSE: 0.00037566316314041615
 Epoch 31 MSE: 0.0005903263227082789
 Epoch 32 MSE: 0.00057415192713961
 Epoch 33 MSE: 0.00044022814836353064
 Epoch 34 MSE: 0.0003897933929692954
 Epoch 35 MSE: 0.00045812551979906857
 Epoch 36 MSE: 0.000488189427414909
 Epoch 37 MSE: 0.0003477517166174948
 Epoch 38 MSE: 0.0001291118242079392
 Epoch 39 MSE: 4.772728789248504e-05
 Epoch 40 MSE: 0.00016554231115151197
 Epoch 41 MSE: 0.0003175752644892782
 Epoch 42 MSE: 0.0003260724770370871
 Epoch 43 MSE: 0.00020462312386371195
 Epoch 44 MSE: 0.00010212827328359708
 Epoch 45 MSE: 9.807762398850173e-05
 Epoch 46 MSE: 0.0001326723286183551
 Epoch 47 MSE: 0.00013018090976402164
 Epoch 48 MSE: 0.00010243273572996259
 Epoch 49 MSE: 0.00010117741476278752
 Epoch 50 MSE: 0.00013013722491450608
 Epoch 51 MSE: 0.0001431655400665477
 Epoch 52 MSE: 0.00010955549078062177
 Epoch 53 MSE: 5.572067675529979e-05
 Epoch 54 MSE: 3.4837958082789555e-05
 Epoch 55 MSE: 6.10963543294929e-05
 Epoch 56 MSE: 9.267429413739592e-05
 Epoch 57 MSE: 8.996023098006845e-05
 Epoch 58 MSE: 6.48604691377841e-05
 Epoch 59 MSE: 5.12432525283657e-05
 Epoch 60 MSE: 5.43672067578882e-05
 Epoch 61 MSE: 5.522068022401072e-05
 Epoch 62 MSE: 4.6621895307907835e-05
 Epoch 63 MSE: 4.1491861338727176e-05
 Epoch 64 MSE: 4.876060120295733e-05
 Epoch 65 MSE: 5.7778754126047716e-05
 Epoch 66 MSE: 5.371328006731346e-05
 Epoch 67 MSE: 3.9405083953170106e-05
 Epoch 68 MSE: 3.0961389711592346e-05
 Epoch 69 MSE: 3.514246054692194e-05
 Epoch 70 MSE: 4.230751801514998e-05
 Epoch 71 MSE: 4.2306124669266865e-05
 Epoch 72 MSE: 3.7418903957586735e-05


```
Epoch 73 MSE: 3.515679782140069e-05
Epoch 74 MSE: 3.5786368243861943e-05
Epoch 75 MSE: 3.440362706896849e-05
Epoch 76 MSE: 3.100948015344329e-05
Epoch 77 MSE: 3.0363396945176646e-05
Epoch 78 MSE: 3.333540735184215e-05
Epoch 79 MSE: 3.516208380460739e-05
Epoch 80 MSE: 3.276917777839117e-05
Epoch 81 MSE: 2.9066435672575608e-05
Epoch 82 MSE: 2.8185382689116523e-05
Epoch 83 MSE: 2.968939588754438e-05
Epoch 84 MSE: 3.0328046705108136e-05
Epoch 85 MSE: 2.9376946258707903e-05
Epoch 86 MSE: 2.8730630219797604e-05
Epoch 87 MSE: 2.8911943445564248e-05
Epoch 88 MSE: 2.8512082280940376e-05
Epoch 89 MSE: 2.725705417105928e-05
Epoch 90 MSE: 2.6677844289224595e-05
Epoch 91 MSE: 2.7400868930271827e-05
Epoch 92 MSE: 2.802954077196773e-05
Epoch 93 MSE: 2.7431246053311042e-05
Epoch 94 MSE: 2.638915611896664e-05
Epoch 95 MSE: 2.6084591809194535e-05
Epoch 96 MSE: 2.6323717975174077e-05
Epoch 97 MSE: 2.6283149054506794e-05
Epoch 98 MSE: 2.5976780307246372e-05
Epoch 99 MSE: 2.5904790163622238e-05
T-time: 53.807433128356934
```

```
=====
Train Score: 0.15 RMSE
=====
Validation Score: 4.23 RMSE
=====
```

```
=====
Time Step = 30 | Hidden States = 2 | Num Layers = 1
=====
```

```
Epoch 0 MSE: 0.07426975667476654
Epoch 1 MSE: 0.062000639736652374
Epoch 2 MSE: 0.05237584561109543
Epoch 3 MSE: 0.04559844732284546
Epoch 4 MSE: 0.04167785868048668
Epoch 5 MSE: 0.04025387018918991
Epoch 6 MSE: 0.04044682905077934
Epoch 7 MSE: 0.04102233052253723
Epoch 8 MSE: 0.04096795618534088
```

Epoch 9 MSE: 0.03989556431770325
Epoch 10 MSE: 0.03795135021209717
Epoch 11 MSE: 0.03553568571805954
Epoch 12 MSE: 0.03307943418622017
Epoch 13 MSE: 0.03091735951602459
Epoch 14 MSE: 0.029232043772935867
Epoch 15 MSE: 0.028046315535902977
Epoch 16 MSE: 0.02725265920162201
Epoch 17 MSE: 0.026668118312954903
Epoch 18 MSE: 0.026097716763615608
Epoch 19 MSE: 0.02538789063692093
Epoch 20 MSE: 0.024457156658172607
Epoch 21 MSE: 0.02330155298113823
Epoch 22 MSE: 0.021980099380016327
Epoch 23 MSE: 0.02058880589902401
Epoch 24 MSE: 0.019230898469686508
Epoch 25 MSE: 0.017989255487918854
Epoch 26 MSE: 0.016906043514609337
Epoch 27 MSE: 0.015974009409546852
Epoch 28 MSE: 0.015142470598220825
Epoch 29 MSE: 0.014337236993014812
Epoch 30 MSE: 0.013488230295479298
Epoch 31 MSE: 0.012554431334137917
Epoch 32 MSE: 0.011536561883985996
Epoch 33 MSE: 0.010473373346030712
Epoch 34 MSE: 0.009424394927918911
Epoch 35 MSE: 0.008446639403700829
Epoch 36 MSE: 0.007573997136205435
Epoch 37 MSE: 0.006806546822190285
Epoch 38 MSE: 0.006113657262176275
Epoch 39 MSE: 0.005449836608022451
Epoch 40 MSE: 0.004776856862008572
Epoch 41 MSE: 0.004082249011844397
Epoch 42 MSE: 0.003385331481695175
Epoch 43 MSE: 0.0027277341578155756
Epoch 44 MSE: 0.0021529707591980696
Epoch 45 MSE: 0.0016852000262588263
Epoch 46 MSE: 0.0013184379786252975
Epoch 47 MSE: 0.0010227622697129846
Epoch 48 MSE: 0.0007643487770110369
Epoch 49 MSE: 0.000526878226082772
Epoch 50 MSE: 0.00032009449205361307
Epoch 51 MSE: 0.00016968441195786
Epoch 52 MSE: 9.55969444476068e-05
Epoch 53 MSE: 9.423273149877787e-05
Epoch 54 MSE: 0.00013779947767034173
Epoch 55 MSE: 0.00019160134252160788
Epoch 56 MSE: 0.00023551513731945306

Epoch 57 MSE: 0.0002721938362810761
Epoch 58 MSE: 0.00031620936351828277
Epoch 59 MSE: 0.0003749807656276971
Epoch 60 MSE: 0.00043858392746187747
Epoch 61 MSE: 0.00048655507271178067
Epoch 62 MSE: 0.0005041291587986052
Epoch 63 MSE: 0.0004926525289192796
Epoch 64 MSE: 0.0004658012476284057
Epoch 65 MSE: 0.00043682492105290294
Epoch 66 MSE: 0.0004090256989002228
Epoch 67 MSE: 0.00037692641490139067
Epoch 68 MSE: 0.0003350116603542119
Epoch 69 MSE: 0.00028484471840783954
Epoch 70 MSE: 0.00023451828747056425
Epoch 71 MSE: 0.00019230120233260095
Epoch 72 MSE: 0.00016100452921818942
Epoch 73 MSE: 0.00013766600750386715
Epoch 74 MSE: 0.00011774702579714358
Epoch 75 MSE: 9.942724864231423e-05
Epoch 76 MSE: 8.445165440207347e-05
Epoch 77 MSE: 7.559631922049448e-05
Epoch 78 MSE: 7.361640018643811e-05
Epoch 79 MSE: 7.637815724592656e-05
Epoch 80 MSE: 8.051947952480987e-05
Epoch 81 MSE: 8.382488158531487e-05
Epoch 82 MSE: 8.624481415608898e-05
Epoch 83 MSE: 8.899832027964294e-05
Epoch 84 MSE: 9.287395369028673e-05
Epoch 85 MSE: 9.729454905027524e-05
Epoch 86 MSE: 0.00010078714694827795
Epoch 87 MSE: 0.00010221383126918226
Epoch 88 MSE: 0.00010158870281884447
Epoch 89 MSE: 9.98524046735838e-05
Epoch 90 MSE: 9.795380174182355e-05
Epoch 91 MSE: 9.612715075490996e-05
Epoch 92 MSE: 9.393812069902197e-05
Epoch 93 MSE: 9.09233494894579e-05
Epoch 94 MSE: 8.715822332305834e-05
Epoch 95 MSE: 8.325346425408497e-05
Epoch 96 MSE: 7.9863122664392e-05
Epoch 97 MSE: 7.721227302681655e-05
Epoch 98 MSE: 7.506186375394464e-05
Epoch 99 MSE: 7.307354098884389e-05
T-time: 11.532892942428589

=====
Train Score: 0.26 RMSE
=====

Validation Score: 7.25 RMSE

=====

=====

Time Step = 30 | Hidden States = 2 | Num Layers = 2

=====

Epoch	0	MSE:	0.045390594750642776
Epoch	1	MSE:	0.039350736886262894
Epoch	2	MSE:	0.03680720552802086
Epoch	3	MSE:	0.03701814264059067
Epoch	4	MSE:	0.03824859857559204
Epoch	5	MSE:	0.0388982854783535
Epoch	6	MSE:	0.038589753210544586
Epoch	7	MSE:	0.03770042955875397
Epoch	8	MSE:	0.03673737496137619
Epoch	9	MSE:	0.03607097640633583
Epoch	10	MSE:	0.035849325358867645
Epoch	11	MSE:	0.0359949916601181
Epoch	12	MSE:	0.036277927458286285
Epoch	13	MSE:	0.03645012155175209
Epoch	14	MSE:	0.03637011721730232
Epoch	15	MSE:	0.03604400157928467
Epoch	16	MSE:	0.03558318316936493
Epoch	17	MSE:	0.03512867912650108
Epoch	18	MSE:	0.03478314355015755
Epoch	19	MSE:	0.03457093611359596
Epoch	20	MSE:	0.034435905516147614
Epoch	21	MSE:	0.034276578575372696
Epoch	22	MSE:	0.03400101885199547
Epoch	23	MSE:	0.0335712656378746
Epoch	24	MSE:	0.03301503136754036
Epoch	25	MSE:	0.03240370377898216
Epoch	26	MSE:	0.03181092441082001
Epoch	27	MSE:	0.03126993775367737
Epoch	28	MSE:	0.030750151723623276
Epoch	29	MSE:	0.03017323836684227
Epoch	30	MSE:	0.029467524960637093
Epoch	31	MSE:	0.028618155047297478
Epoch	32	MSE:	0.027671774849295616
Epoch	33	MSE:	0.026697954162955284
Epoch	34	MSE:	0.025737443938851357
Epoch	35	MSE:	0.024771245196461678
Epoch	36	MSE:	0.023736145347356796
Epoch	37	MSE:	0.022581100463867188
Epoch	38	MSE:	0.02131466381251812
Epoch	39	MSE:	0.019995225593447685
Epoch	40	MSE:	0.018670178949832916

Epoch	41	MSE:	0.017325809225440025
Epoch	42	MSE:	0.015916241332888603
Epoch	43	MSE:	0.014441956765949726
Epoch	44	MSE:	0.01296877022832632
Epoch	45	MSE:	0.011557161808013916
Epoch	46	MSE:	0.010190810076892376
Epoch	47	MSE:	0.008824973367154598
Epoch	48	MSE:	0.007495538331568241
Epoch	49	MSE:	0.006299460772424936
Epoch	50	MSE:	0.0052687483839690685
Epoch	51	MSE:	0.004368013236671686
Epoch	52	MSE:	0.0036305158864706755
Epoch	53	MSE:	0.0031113987788558006
Epoch	54	MSE:	0.0027501315344125032
Epoch	55	MSE:	0.0024988132063299417
Epoch	56	MSE:	0.0023953800555318594
Epoch	57	MSE:	0.002380162477493286
Epoch	58	MSE:	0.0023700492456555367
Epoch	59	MSE:	0.0023610915523022413
Epoch	60	MSE:	0.002313115866854787
Epoch	61	MSE:	0.002181589836254716
Epoch	62	MSE:	0.001987042836844921
Epoch	63	MSE:	0.001752917654812336
Epoch	64	MSE:	0.0014906941214576364
Epoch	65	MSE:	0.0012382145505398512
Epoch	66	MSE:	0.001039140741340816
Epoch	67	MSE:	0.0009074332192540169
Epoch	68	MSE:	0.0008409326546825469
Epoch	69	MSE:	0.0008368900744244456
Epoch	70	MSE:	0.0008774701273068786
Epoch	71	MSE:	0.0009306532447226346
Epoch	72	MSE:	0.0009729483281262219
Epoch	73	MSE:	0.000991307431831956
Epoch	74	MSE:	0.0009741855319589376
Epoch	75	MSE:	0.0009202486253343523
Epoch	76	MSE:	0.0008440037490800023
Epoch	77	MSE:	0.0007627123268321157
Epoch	78	MSE:	0.0006883539608679712
Epoch	79	MSE:	0.0006321161636151373
Epoch	80	MSE:	0.0006013473030179739
Epoch	81	MSE:	0.0005925524746999145
Epoch	82	MSE:	0.0005973762017674744
Epoch	83	MSE:	0.0006089253001846373
Epoch	84	MSE:	0.0006183059304021299
Epoch	85	MSE:	0.000617250450886786
Epoch	86	MSE:	0.0006043243338353932
Epoch	87	MSE:	0.0005812608869746327
Epoch	88	MSE:	0.0005505243898369372

Epoch 89 MSE: 0.0005180013249628246
Epoch 90 MSE: 0.0004894958692602813
Epoch 91 MSE: 0.0004672675277106464
Epoch 92 MSE: 0.00045255996519699693
Epoch 93 MSE: 0.0004451405256986618
Epoch 94 MSE: 0.00044173645437695086
Epoch 95 MSE: 0.00043909301166422665
Epoch 96 MSE: 0.00043515002471394837
Epoch 97 MSE: 0.00042786597623489797
Epoch 98 MSE: 0.0004167752340435982
Epoch 99 MSE: 0.00040325874579139054
T-time: 21.473809242248535

=====
Train Score: 0.60 RMSE

=====
Validation Score: 13.74 RMSE
=====

=====
Time Step = 30 | Hidden States = 4 | Num Layers = 1
=====

Epoch 0 MSE: 0.10172559320926666
Epoch 1 MSE: 0.0781208872795105
Epoch 2 MSE: 0.05888362601399422
Epoch 3 MSE: 0.04382132366299629
Epoch 4 MSE: 0.03268958255648613
Epoch 5 MSE: 0.025147534906864166
Epoch 6 MSE: 0.02074587345123291
Epoch 7 MSE: 0.018936505541205406
Epoch 8 MSE: 0.019080597907304764
Epoch 9 MSE: 0.020466674119234085
Epoch 10 MSE: 0.02236625738441944
Epoch 11 MSE: 0.024130649864673615
Epoch 12 MSE: 0.025288831442594528
Epoch 13 MSE: 0.025595931336283684
Epoch 14 MSE: 0.025018129497766495
Epoch 15 MSE: 0.02367762289941311
Epoch 16 MSE: 0.021788129583001137
Epoch 17 MSE: 0.019598770886659622
Epoch 18 MSE: 0.01735163852572441
Epoch 19 MSE: 0.01525251753628254
Epoch 20 MSE: 0.01345239207148552
Epoch 21 MSE: 0.012037975713610649
Epoch 22 MSE: 0.011030289344489574
Epoch 23 MSE: 0.010390848852694035
Epoch 24 MSE: 0.010034598410129547

Epoch	25	MSE:	0.009847946465015411
Epoch	26	MSE:	0.009709222242236137
Epoch	27	MSE:	0.00950848963111639
Epoch	28	MSE:	0.009163789451122284
Epoch	29	MSE:	0.008631598204374313
Epoch	30	MSE:	0.007910448126494884
Epoch	31	MSE:	0.007037723436951637
Epoch	32	MSE:	0.0060806372202932835
Epoch	33	MSE:	0.005122888367623091
Epoch	34	MSE:	0.004248792305588722
Epoch	35	MSE:	0.003526927437633276
Epoch	36	MSE:	0.0029957741498947144
Epoch	37	MSE:	0.002654524752870202
Epoch	38	MSE:	0.0024625505320727825
Epoch	39	MSE:	0.002350008813664317
Epoch	40	MSE:	0.002238771878182888
Epoch	41	MSE:	0.002067751716822386
Epoch	42	MSE:	0.001812955946661532
Epoch	43	MSE:	0.001493616495281458
Epoch	44	MSE:	0.0011618263088166714
Epoch	45	MSE:	0.0008804677636362612
Epoch	46	MSE:	0.0006987605593167245
Epoch	47	MSE:	0.0006348308525048196
Epoch	48	MSE:	0.0006712157046422362
Epoch	49	MSE:	0.0007638825918547809
Epoch	50	MSE:	0.0008601820445619524
Epoch	51	MSE:	0.0009180687484331429
Epoch	52	MSE:	0.0009191518765874207
Epoch	53	MSE:	0.0008713420829735696
Epoch	54	MSE:	0.0008013212936930358
Epoch	55	MSE:	0.0007408259552903473
Epoch	56	MSE:	0.0007125916890799999
Epoch	57	MSE:	0.0007215572404675186
Epoch	58	MSE:	0.0007546085980720818
Epoch	59	MSE:	0.0007884004735387862
Epoch	60	MSE:	0.0008010356104932725
Epoch	61	MSE:	0.0007816759753040969
Epoch	62	MSE:	0.0007337409188039601
Epoch	63	MSE:	0.0006711739697493613
Epoch	64	MSE:	0.000610764604061842
Epoch	65	MSE:	0.0005647919024340808
Epoch	66	MSE:	0.0005371403531171381
Epoch	67	MSE:	0.0005237582954578102
Epoch	68	MSE:	0.0005162613233551383
Epoch	69	MSE:	0.0005064647411927581
Epoch	70	MSE:	0.0004897977923974395
Epoch	71	MSE:	0.000466477737063542
Epoch	72	MSE:	0.00044046901166439056

Epoch 73 MSE: 0.00041710646473802626
Epoch 74 MSE: 0.00040059391176328063
Epoch 75 MSE: 0.0003923977492377162
Epoch 76 MSE: 0.00039102204027585685
Epoch 77 MSE: 0.0003930222010239959
Epoch 78 MSE: 0.00039463507710024714
Epoch 79 MSE: 0.0003932579420506954
Epoch 80 MSE: 0.0003881961456499994
Epoch 81 MSE: 0.000380502751795575
Epoch 82 MSE: 0.00037214282201603055
Epoch 83 MSE: 0.0003649518475867808
Epoch 84 MSE: 0.0003598583862185478
Epoch 85 MSE: 0.00035664098686538637
Epoch 86 MSE: 0.0003542197518981993
Epoch 87 MSE: 0.00035126664442941546
Epoch 88 MSE: 0.00034681917168200016
Epoch 89 MSE: 0.0003406442410778254
Epoch 90 MSE: 0.00033323641400784254
Epoch 91 MSE: 0.00032551318872720003
Epoch 92 MSE: 0.0003183778317179531
Epoch 93 MSE: 0.0003123583155684173
Epoch 94 MSE: 0.0003074638661928475
Epoch 95 MSE: 0.000303286244161427
Epoch 96 MSE: 0.00029926502611488104
Epoch 97 MSE: 0.000294973113341257
Epoch 98 MSE: 0.0002902905980590731
Epoch 99 MSE: 0.0002854070335160941
T-time: 11.514758825302124

=====

Train Score: 0.50 RMSE

=====

Validation Score: 11.71 RMSE

=====

=====

Time Step = 30 | Hidden States = 4 | Num Layers = 2

=====

Epoch 0 MSE: 0.1436184197664261
Epoch 1 MSE: 0.1094832792878151
Epoch 2 MSE: 0.0821676105260849
Epoch 3 MSE: 0.061953507363796234
Epoch 4 MSE: 0.04880587011575699
Epoch 5 MSE: 0.04236113280057907
Epoch 6 MSE: 0.041620783507823944
Epoch 7 MSE: 0.04454553872346878
Epoch 8 MSE: 0.04836833104491234

Epoch	9	MSE:	0.050834186375141144
Epoch	10	MSE:	0.05102282017469406
Epoch	11	MSE:	0.04914330691099167
Epoch	12	MSE:	0.04595961794257164
Epoch	13	MSE:	0.04233471676707268
Epoch	14	MSE:	0.03897499665617943
Epoch	15	MSE:	0.036327064037323
Epoch	16	MSE:	0.03457234427332878
Epoch	17	MSE:	0.03367637097835541
Epoch	18	MSE:	0.03345925733447075
Epoch	19	MSE:	0.0336662121117115
Epoch	20	MSE:	0.03402752801775932
Epoch	21	MSE:	0.03430381789803505
Epoch	22	MSE:	0.03431626781821251
Epoch	23	MSE:	0.03396279737353325
Epoch	24	MSE:	0.03322184458374977
Epoch	25	MSE:	0.032145507633686066
Epoch	26	MSE:	0.030843621119856834
Epoch	27	MSE:	0.02946051023900509
Epoch	28	MSE:	0.02814604341983795
Epoch	29	MSE:	0.027023382484912872
Epoch	30	MSE:	0.026158176362514496
Epoch	31	MSE:	0.02553708478808403
Epoch	32	MSE:	0.025065623223781586
Epoch	33	MSE:	0.02459254488348961
Epoch	34	MSE:	0.023958027362823486
Epoch	35	MSE:	0.023049423471093178
Epoch	36	MSE:	0.02184179797768593
Epoch	37	MSE:	0.02040644735097885
Epoch	38	MSE:	0.018884656950831413
Epoch	39	MSE:	0.017435351386666298
Epoch	40	MSE:	0.01617189310491085
Epoch	41	MSE:	0.015107354149222374
Epoch	42	MSE:	0.014133972115814686
Epoch	43	MSE:	0.013064871542155743
Epoch	44	MSE:	0.011742875911295414
Epoch	45	MSE:	0.010161374695599079
Epoch	46	MSE:	0.00849875994026661
Epoch	47	MSE:	0.00701147923246026
Epoch	48	MSE:	0.005840460304170847
Epoch	49	MSE:	0.004887741524726152
Epoch	50	MSE:	0.0039213490672409534
Epoch	51	MSE:	0.0028562035877257586
Epoch	52	MSE:	0.0019121579825878143
Epoch	53	MSE:	0.0014125903835520148
Epoch	54	MSE:	0.001334658358246088
Epoch	55	MSE:	0.001246785745024681
Epoch	56	MSE:	0.0010172647889703512

```

Epoch 57 MSE: 0.001050526974722743
Epoch 58 MSE: 0.0014707386726513505
Epoch 59 MSE: 0.0018027713522315025
Epoch 60 MSE: 0.0018545115599408746
Epoch 61 MSE: 0.001987017458304763
Epoch 62 MSE: 0.0022370556835085154
Epoch 63 MSE: 0.0022244032006710768
Epoch 64 MSE: 0.0020072711631655693
Epoch 65 MSE: 0.0018829344771802425
Epoch 66 MSE: 0.0017760212067514658
Epoch 67 MSE: 0.0015214604791253805
Epoch 68 MSE: 0.0012430871138349175
Epoch 69 MSE: 0.001089791301637888
Epoch 70 MSE: 0.0009910570224747062
Epoch 71 MSE: 0.0008537188987247646
Epoch 72 MSE: 0.0007327836356125772
Epoch 73 MSE: 0.0007001374033279717
Epoch 74 MSE: 0.0007212503696791828
Epoch 75 MSE: 0.0007304437458515167
Epoch 76 MSE: 0.0007287553744390607
Epoch 77 MSE: 0.0007523744134232402
Epoch 78 MSE: 0.000796590989921242
Epoch 79 MSE: 0.0008221938624046743
Epoch 80 MSE: 0.0008166597108356655
Epoch 81 MSE: 0.0008034627535380423
Epoch 82 MSE: 0.0007982741808518767
Epoch 83 MSE: 0.0007878367905505002
Epoch 84 MSE: 0.0007574037881568074
Epoch 85 MSE: 0.000716442649718374
Epoch 86 MSE: 0.0006835339590907097
Epoch 87 MSE: 0.000659369514323771
Epoch 88 MSE: 0.0006313305930234492
Epoch 89 MSE: 0.0005983242299407721
Epoch 90 MSE: 0.000572973454836756
Epoch 91 MSE: 0.0005601720185950398
Epoch 92 MSE: 0.0005506441229954362
Epoch 93 MSE: 0.0005385380354709923
Epoch 94 MSE: 0.0005300610791891813
Epoch 95 MSE: 0.0005294851725921035
Epoch 96 MSE: 0.0005301382625475526
Epoch 97 MSE: 0.0005260946927592158
Epoch 98 MSE: 0.0005210416275076568
Epoch 99 MSE: 0.0005187313654460013
T-time: 20.742391347885132

```

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=====
Train Score: 0.68 RMSE
=====

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Validation Score: 12.74 RMSE

=====

=====

Time Step = 30 | Hidden States = 8 | Num Layers = 1

=====

Epoch	0	MSE:	0.21351739764213562
Epoch	1	MSE:	0.164730042219162
Epoch	2	MSE:	0.12436427921056747
Epoch	3	MSE:	0.09208180010318756
Epoch	4	MSE:	0.06759892404079437
Epoch	5	MSE:	0.050512317568063736
Epoch	6	MSE:	0.040263187140226364
Epoch	7	MSE:	0.036045171320438385
Epoch	8	MSE:	0.036608047783374786
Epoch	9	MSE:	0.04003872349858284
Epoch	10	MSE:	0.043997667729854584
Epoch	11	MSE:	0.04662675783038139
Epoch	12	MSE:	0.04713103175163269
Epoch	13	MSE:	0.04560443013906479
Epoch	14	MSE:	0.042607855051755905
Epoch	15	MSE:	0.03883108124136925
Epoch	16	MSE:	0.0348941832780838
Epoch	17	MSE:	0.03125745430588722
Epoch	18	MSE:	0.028200820088386536
Epoch	19	MSE:	0.025842251256108284
Epoch	20	MSE:	0.02417420968413353
Epoch	21	MSE:	0.023104529827833176
Epoch	22	MSE:	0.02249378152191639
Epoch	23	MSE:	0.022185439243912697
Epoch	24	MSE:	0.02202806994318962
Epoch	25	MSE:	0.02189008705317974
Epoch	26	MSE:	0.02166835591197014
Epoch	27	MSE:	0.021291956305503845
Epoch	28	MSE:	0.020722297951579094
Epoch	29	MSE:	0.019950561225414276
Epoch	30	MSE:	0.01899326965212822
Epoch	31	MSE:	0.017886633053421974
Epoch	32	MSE:	0.0166801568120718
Epoch	33	MSE:	0.015429922379553318
Epoch	34	MSE:	0.01419189665466547
Epoch	35	MSE:	0.013015655800700188
Epoch	36	MSE:	0.011938859708607197
Epoch	37	MSE:	0.010983036831021309
Epoch	38	MSE:	0.01015122327953577
Epoch	39	MSE:	0.009428092278540134
Epoch	40	MSE:	0.008783013559877872

Epoch 41 MSE: 0.008176049217581749
 Epoch 42 MSE: 0.0075661917217075825
 Epoch 43 MSE: 0.00692035211250186
 Epoch 44 MSE: 0.006221011281013489
 Epoch 45 MSE: 0.0054704430513083935
 Epoch 46 MSE: 0.0046902489848434925
 Epoch 47 MSE: 0.0039160894230008125
 Epoch 48 MSE: 0.0031889728270471096
 Epoch 49 MSE: 0.0025453930720686913
 Epoch 50 MSE: 0.002008900512009859
 Epoch 51 MSE: 0.0015853125369176269
 Epoch 52 MSE: 0.0012627788819372654
 Epoch 53 MSE: 0.001016636728309095
 Epoch 54 MSE: 0.0008176728733815253
 Epoch 55 MSE: 0.000641348771750927
 Epoch 56 MSE: 0.0004751388914883137
 Epoch 57 MSE: 0.0003215102478861809
 Epoch 58 MSE: 0.00019529163546394557
 Epoch 59 MSE: 0.00011597734555834904
 Epoch 60 MSE: 9.750857134349644e-05
 Epoch 61 MSE: 0.00013960291107650846
 Epoch 62 MSE: 0.00022489324328489602
 Epoch 63 MSE: 0.0003241243539378047
 Epoch 64 MSE: 0.0004075949836988002
 Epoch 65 MSE: 0.0004570266464725137
 Epoch 66 MSE: 0.000471253355499357
 Epoch 67 MSE: 0.00046283614938147366
 Epoch 68 MSE: 0.00044842352508567274
 Epoch 69 MSE: 0.0004390637041069567
 Epoch 70 MSE: 0.0004356926365289837
 Epoch 71 MSE: 0.0004310924850869924
 Epoch 72 MSE: 0.0004158492374699563
 Epoch 73 MSE: 0.00038433808367699385
 Epoch 74 MSE: 0.0003377113025635481
 Epoch 75 MSE: 0.0002830395824275911
 Epoch 76 MSE: 0.00022977543994784355
 Epoch 77 MSE: 0.00018568245286587626
 Epoch 78 MSE: 0.0001541810343042016
 Epoch 79 MSE: 0.00013404269702732563
 Epoch 80 MSE: 0.00012112237163819373
 Epoch 81 MSE: 0.00011094022920588031
 Epoch 82 MSE: 0.00010076151374960318
 Epoch 83 MSE: 9.033432434080169e-05
 Epoch 84 MSE: 8.125745807774365e-05
 Epoch 85 MSE: 7.559829100500792e-05
 Epoch 86 MSE: 7.458018808392808e-05
 Epoch 87 MSE: 7.792992983013391e-05
 Epoch 88 MSE: 8.403970423387364e-05

Epoch 89 MSE: 9.070222586160526e-05
Epoch 90 MSE: 9.598826727597043e-05
Epoch 91 MSE: 9.886678162729368e-05
Epoch 92 MSE: 9.93604990071617e-05
Epoch 93 MSE: 9.825827146414667e-05
Epoch 94 MSE: 9.658539784140885e-05
Epoch 95 MSE: 9.509457595413551e-05
Epoch 96 MSE: 9.399078408023342e-05
Epoch 97 MSE: 9.296715870732442e-05
Epoch 98 MSE: 9.148293611360714e-05
Epoch 99 MSE: 8.91140807652846e-05
T-time: 13.115161657333374

=====
Train Score: 0.28 RMSE
=====
Validation Score: 6.58 RMSE
=====

=====
Time Step = 30 | Hidden States = 8 | Num Layers = 2
=====

Epoch 0 MSE: 0.036985356360673904
Epoch 1 MSE: 0.03314022719860077
Epoch 2 MSE: 0.03371749818325043
Epoch 3 MSE: 0.02924608625471592
Epoch 4 MSE: 0.026496101170778275
Epoch 5 MSE: 0.02625010907649994
Epoch 6 MSE: 0.024669194594025612
Epoch 7 MSE: 0.020849399268627167
Epoch 8 MSE: 0.01729733496904373
Epoch 9 MSE: 0.01545712724328041
Epoch 10 MSE: 0.013237955048680305
Epoch 11 MSE: 0.00919547863304615
Epoch 12 MSE: 0.005677820648998022
Epoch 13 MSE: 0.004274210426956415
Epoch 14 MSE: 0.00218124408274889
Epoch 15 MSE: 0.00017289200332015753
Epoch 16 MSE: 0.0018237725598737597
Epoch 17 MSE: 0.0022095083259046078
Epoch 18 MSE: 0.0033004777505993843
Epoch 19 MSE: 0.004816312808543444
Epoch 20 MSE: 0.0035554144997149706
Epoch 21 MSE: 0.003253368893638253
Epoch 22 MSE: 0.0022909604012966156
Epoch 23 MSE: 0.0008338794577866793
Epoch 24 MSE: 0.0005618659779429436

Epoch	25	MSE:	0.0005009935121051967
Epoch	26	MSE:	0.0002700543846003711
Epoch	27	MSE:	0.0004934340249747038
Epoch	28	MSE:	0.000973257003352046
Epoch	29	MSE:	0.0011502079432830215
Epoch	30	MSE:	0.0011257764417678118
Epoch	31	MSE:	0.0012138942256569862
Epoch	32	MSE:	0.0012878740672022104
Epoch	33	MSE:	0.0011043797712773085
Epoch	34	MSE:	0.0008022024994716048
Epoch	35	MSE:	0.0006311459001153708
Epoch	36	MSE:	0.0005090520717203617
Epoch	37	MSE:	0.00028442012262530625
Epoch	38	MSE:	0.00012559328752104193
Epoch	39	MSE:	0.00016858721210155636
Epoch	40	MSE:	0.00022212717158254236
Epoch	41	MSE:	0.000226540447329171
Epoch	42	MSE:	0.0003340729745104909
Epoch	43	MSE:	0.0004348524089436978
Epoch	44	MSE:	0.00039743815432302654
Epoch	45	MSE:	0.00036438563256524503
Epoch	46	MSE:	0.00034211541060358286
Epoch	47	MSE:	0.0002379098004894331
Epoch	48	MSE:	0.00015431895735673606
Epoch	49	MSE:	0.00014067125448491424
Epoch	50	MSE:	0.00011450525198597461
Epoch	51	MSE:	9.730747842695564e-05
Epoch	52	MSE:	0.0001339448062935844
Epoch	53	MSE:	0.00016578557551838458
Epoch	54	MSE:	0.00016791047528386116
Epoch	55	MSE:	0.00018071362865157425
Epoch	56	MSE:	0.00019042694475501776
Epoch	57	MSE:	0.00016653590137138963
Epoch	58	MSE:	0.00013991919695399702
Epoch	59	MSE:	0.0001276279508601874
Epoch	60	MSE:	0.00010527957056183368
Epoch	61	MSE:	8.497262024320662e-05
Epoch	62	MSE:	8.797337068244815e-05
Epoch	63	MSE:	9.201667126035318e-05
Epoch	64	MSE:	9.229007991962135e-05
Epoch	65	MSE:	0.00010439481411594898
Epoch	66	MSE:	0.00011114118387922645
Epoch	67	MSE:	0.00010566796117927879
Epoch	68	MSE:	0.00010377125727245584
Epoch	69	MSE:	9.784718713490292e-05
Epoch	70	MSE:	8.52206940180622e-05
Epoch	71	MSE:	7.995138730620965e-05
Epoch	72	MSE:	7.728247146587819e-05

```

Epoch 73 MSE: 7.31754771550186e-05
Epoch 74 MSE: 7.553488103440031e-05
Epoch 75 MSE: 7.909375563031062e-05
Epoch 76 MSE: 7.888913387432694e-05
Epoch 77 MSE: 8.028353477129713e-05
Epoch 78 MSE: 8.032181358430535e-05
Epoch 79 MSE: 7.625704893143848e-05
Epoch 80 MSE: 7.349526276811957e-05
Epoch 81 MSE: 7.101775554474443e-05
Epoch 82 MSE: 6.727770232828334e-05
Epoch 83 MSE: 6.628615665249527e-05
Epoch 84 MSE: 6.638060585828498e-05
Epoch 85 MSE: 6.57582568237558e-05
Epoch 86 MSE: 6.666537228738889e-05
Epoch 87 MSE: 6.697847129544243e-05
Epoch 88 MSE: 6.581100751645863e-05
Epoch 89 MSE: 6.514940469060093e-05
Epoch 90 MSE: 6.362426211126149e-05
Epoch 91 MSE: 6.163213402032852e-05
Epoch 92 MSE: 6.0712329286616296e-05
Epoch 93 MSE: 5.9649690228980035e-05
Epoch 94 MSE: 5.892682384001091e-05
Epoch 95 MSE: 5.9003035858040676e-05
Epoch 96 MSE: 5.862106627319008e-05
Epoch 97 MSE: 5.825829430250451e-05
Epoch 98 MSE: 5.793706441181712e-05
Epoch 99 MSE: 5.697598680853844e-05
T-time: 26.715670347213745

```

```

=====
Train Score: 0.23 RMSE
=====
Validation Score: 6.12 RMSE
=====

```

```

=====
Time Step = 30 | Hidden States = 16 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.06656069308519363
Epoch 1 MSE: 0.04400709643959999
Epoch 2 MSE: 0.033478207886219025
Epoch 3 MSE: 0.03324396535754204
Epoch 4 MSE: 0.035320982336997986
Epoch 5 MSE: 0.0336645282804966
Epoch 6 MSE: 0.02948327176272869
Epoch 7 MSE: 0.025410495698451996
Epoch 8 MSE: 0.02278260327875614

```

Epoch 9 MSE: 0.021626513451337814
 Epoch 10 MSE: 0.021211277693510056
 Epoch 11 MSE: 0.02061803825199604
 Epoch 12 MSE: 0.01926291175186634
 Epoch 13 MSE: 0.01712622679769993
 Epoch 14 MSE: 0.014615006744861603
 Epoch 15 MSE: 0.012286053039133549
 Epoch 16 MSE: 0.010558963753283024
 Epoch 17 MSE: 0.009454717859625816
 Epoch 18 MSE: 0.008511977270245552
 Epoch 19 MSE: 0.007135134655982256
 Epoch 20 MSE: 0.005150482524186373
 Epoch 21 MSE: 0.003002488287165761
 Epoch 22 MSE: 0.0014745764201506972
 Epoch 23 MSE: 0.0010675411904230714
 Epoch 24 MSE: 0.0013060973724350333
 Epoch 25 MSE: 0.0011892961338162422
 Epoch 26 MSE: 0.0008551861974410713
 Epoch 27 MSE: 0.0013687515165656805
 Epoch 28 MSE: 0.002516166539862752
 Epoch 29 MSE: 0.0027243196964263916
 Epoch 30 MSE: 0.0019303420558571815
 Epoch 31 MSE: 0.0012605045922100544
 Epoch 32 MSE: 0.001069366466253996
 Epoch 33 MSE: 0.000906355504412204
 Epoch 34 MSE: 0.0005415533669292927
 Epoch 35 MSE: 0.00018492508388590068
 Epoch 36 MSE: 6.949693488422781e-05
 Epoch 37 MSE: 0.0001910113642225042
 Epoch 38 MSE: 0.000374839932192117
 Epoch 39 MSE: 0.0004728281346615404
 Epoch 40 MSE: 0.0004691320355050266
 Epoch 41 MSE: 0.000438381772255525
 Epoch 42 MSE: 0.00044580866233445704
 Epoch 43 MSE: 0.0004896598402410746
 Epoch 44 MSE: 0.0005174748366698623
 Epoch 45 MSE: 0.0004831004480365664
 Epoch 46 MSE: 0.00038895304896868765
 Epoch 47 MSE: 0.00028091721469536424
 Epoch 48 MSE: 0.00020638349815271795
 Epoch 49 MSE: 0.00017524762370157987
 Epoch 50 MSE: 0.00015916439588181674
 Epoch 51 MSE: 0.0001279949938179925
 Epoch 52 MSE: 8.416634955210611e-05
 Epoch 53 MSE: 5.770516145275906e-05
 Epoch 54 MSE: 6.933645636308938e-05
 Epoch 55 MSE: 0.00010536506306380033
 Epoch 56 MSE: 0.00013297013356350362


```

Epoch 57 MSE: 0.00013577814388554543
Epoch 58 MSE: 0.00012659208732657135
Epoch 59 MSE: 0.00012511313252616674
Epoch 60 MSE: 0.00013192144979257137
Epoch 61 MSE: 0.00013081778888590634
Epoch 62 MSE: 0.00011243904737057164
Epoch 63 MSE: 8.642177999718115e-05
Epoch 64 MSE: 6.879131979076192e-05
Epoch 65 MSE: 6.404546729754657e-05
Epoch 66 MSE: 6.38224883005023e-05
Epoch 67 MSE: 5.9931266150670126e-05
Epoch 68 MSE: 5.368033089325763e-05
Epoch 69 MSE: 5.190322917769663e-05
Epoch 70 MSE: 5.7195535191567615e-05
Epoch 71 MSE: 6.472896347986534e-05
Epoch 72 MSE: 6.815384404035285e-05
Epoch 73 MSE: 6.63401951896958e-05
Epoch 74 MSE: 6.319882959360257e-05
Epoch 75 MSE: 6.20513383182697e-05
Epoch 76 MSE: 6.195447349455208e-05
Epoch 77 MSE: 5.98369151703082e-05
Epoch 78 MSE: 5.492320633493364e-05
Epoch 79 MSE: 4.9790691264206544e-05
Epoch 80 MSE: 4.7200563130900264e-05
Epoch 81 MSE: 4.7048240958247334e-05
Epoch 82 MSE: 4.711973815574311e-05
Epoch 83 MSE: 4.620179970515892e-05
Epoch 84 MSE: 4.532386446953751e-05
Epoch 85 MSE: 4.584372800309211e-05
Epoch 86 MSE: 4.735010224976577e-05
Epoch 87 MSE: 4.8190286179305986e-05
Epoch 88 MSE: 4.7593795898137614e-05
Epoch 89 MSE: 4.6399560233112425e-05
Epoch 90 MSE: 4.565919516608119e-05
Epoch 91 MSE: 4.5285407395567745e-05
Epoch 92 MSE: 4.4499440264189616e-05
Epoch 93 MSE: 4.3145857489435e-05
Epoch 94 MSE: 4.193802669760771e-05
Epoch 95 MSE: 4.146286300965585e-05
Epoch 96 MSE: 4.147799336351454e-05
Epoch 97 MSE: 4.138601434533484e-05
Epoch 98 MSE: 4.105043990421109e-05
Epoch 99 MSE: 4.082003579242155e-05
T-time: 18.247771978378296

```

```

=====
Train Score: 0.19 RMSE
=====

```

Validation Score: 4.31 RMSE

=====

=====

Time Step = 30 | Hidden States = 16 | Num Layers = 2

=====

Epoch	0	MSE:	0.12340614199638367
Epoch	1	MSE:	0.06406713277101517
Epoch	2	MSE:	0.03487955033779144
Epoch	3	MSE:	0.03404304012656212
Epoch	4	MSE:	0.044927142560482025
Epoch	5	MSE:	0.04334626719355583
Epoch	6	MSE:	0.03541189432144165
Epoch	7	MSE:	0.029305173084139824
Epoch	8	MSE:	0.027143757790327072
Epoch	9	MSE:	0.027600044384598732
Epoch	10	MSE:	0.028556503355503082
Epoch	11	MSE:	0.028456365689635277
Epoch	12	MSE:	0.026773327961564064
Epoch	13	MSE:	0.02378123253583908
Epoch	14	MSE:	0.02014882117509842
Epoch	15	MSE:	0.0166487954556942
Epoch	16	MSE:	0.013932515867054462
Epoch	17	MSE:	0.012189029715955257
Epoch	18	MSE:	0.010705769062042236
Epoch	19	MSE:	0.008163676597177982
Epoch	20	MSE:	0.004212015774101019
Epoch	21	MSE:	0.0007126510026864707
Epoch	22	MSE:	0.0009732190519571304
Epoch	23	MSE:	0.004776041489094496
Epoch	24	MSE:	0.005584117025136948
Epoch	25	MSE:	0.0036646679509431124
Epoch	26	MSE:	0.0026361376512795687
Epoch	27	MSE:	0.0023903390392661095
Epoch	28	MSE:	0.0015552989207208157
Epoch	29	MSE:	0.0005988231278024614
Epoch	30	MSE:	0.0003671535523608327
Epoch	31	MSE:	0.0008614282123744488
Epoch	32	MSE:	0.0015532710822299123
Epoch	33	MSE:	0.001965197967365384
Epoch	34	MSE:	0.001923967618495226
Epoch	35	MSE:	0.0015428685583174229
Epoch	36	MSE:	0.0010826329234987497
Epoch	37	MSE:	0.0007756960112601519
Epoch	38	MSE:	0.0006797664682380855
Epoch	39	MSE:	0.0006561516202054918
Epoch	40	MSE:	0.0005301616620272398

Epoch 41 MSE: 0.0003023058525286615
Epoch 42 MSE: 0.00015867152251303196
Epoch 43 MSE: 0.0002468964667059481
Epoch 44 MSE: 0.0004875654121860862
Epoch 45 MSE: 0.0006507915677502751
Epoch 46 MSE: 0.0005985276075080037
Epoch 47 MSE: 0.00040442601311951876
Epoch 48 MSE: 0.00024043887970037758
Epoch 49 MSE: 0.00019233240163885057
Epoch 50 MSE: 0.0002082519349642098
Epoch 51 MSE: 0.00020185763423796743
Epoch 52 MSE: 0.00015863828593865037
Epoch 53 MSE: 0.00012903135211672634
Epoch 54 MSE: 0.0001516678894404322
Epoch 55 MSE: 0.0002092532959068194
Epoch 56 MSE: 0.00025046011433005333
Epoch 57 MSE: 0.0002393423783360049
Epoch 58 MSE: 0.00018365733558312058
Epoch 59 MSE: 0.00012317337677814066
Epoch 60 MSE: 9.285631676902995e-05
Epoch 61 MSE: 9.451881487620994e-05
Epoch 62 MSE: 0.00010287985787726939
Epoch 63 MSE: 9.803999273572117e-05
Epoch 64 MSE: 8.651495591038838e-05
Epoch 65 MSE: 8.717457967577502e-05
Epoch 66 MSE: 0.0001032620930345729
Epoch 67 MSE: 0.00011700404866132885
Epoch 68 MSE: 0.00011102672578999773
Epoch 69 MSE: 8.798065391601995e-05
Epoch 70 MSE: 6.608860712731257e-05
Epoch 71 MSE: 5.8880374126601964e-05
Epoch 72 MSE: 6.341805419651791e-05
Epoch 73 MSE: 6.7927387135569e-05
Epoch 74 MSE: 6.648371345363557e-05
Epoch 75 MSE: 6.312108598649502e-05
Epoch 76 MSE: 6.353743083309382e-05
Epoch 77 MSE: 6.694010517094284e-05
Epoch 78 MSE: 6.743925769114867e-05
Epoch 79 MSE: 6.164613296277821e-05
Epoch 80 MSE: 5.2853381930617616e-05
Epoch 81 MSE: 4.736110713565722e-05
Epoch 82 MSE: 4.7708352212794125e-05
Epoch 83 MSE: 5.066502853878774e-05
Epoch 84 MSE: 5.178520586923696e-05
Epoch 85 MSE: 5.0391434342600405e-05
Epoch 86 MSE: 4.9009438953362405e-05
Epoch 87 MSE: 4.9065969506045803e-05
Epoch 88 MSE: 4.907344191451557e-05

```

Epoch 89 MSE: 4.716778494184837e-05
Epoch 90 MSE: 4.393039125716314e-05
Epoch 91 MSE: 4.173415436525829e-05
Epoch 92 MSE: 4.182828706689179e-05
Epoch 93 MSE: 4.304547837818973e-05
Epoch 94 MSE: 4.3480646127136424e-05
Epoch 95 MSE: 4.266736868885346e-05
Epoch 96 MSE: 4.159729724051431e-05
Epoch 97 MSE: 4.105296829948202e-05
Epoch 98 MSE: 4.0685205021873116e-05
Epoch 99 MSE: 3.9824124542064965e-05
T-time: 39.022674798965454

```

```

=====
Train Score: 0.19 RMSE
=====
Validation Score: 7.03 RMSE
=====

```

```

=====
Time Step = 30 | Hidden States = 32 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.042843353003263474
Epoch 1 MSE: 0.03270935267210007
Epoch 2 MSE: 0.03124498762190342
Epoch 3 MSE: 0.025008242577314377
Epoch 4 MSE: 0.019258633255958557
Epoch 5 MSE: 0.01602357067167759
Epoch 6 MSE: 0.012408273294568062
Epoch 7 MSE: 0.006237407214939594
Epoch 8 MSE: 0.0013294810196384788
Epoch 9 MSE: 0.005380404647439718
Epoch 10 MSE: 0.003150835633277893
Epoch 11 MSE: 0.0034945064689964056
Epoch 12 MSE: 0.0036857377272099257
Epoch 13 MSE: 0.0011881171958521008
Epoch 14 MSE: 0.00012308255827520043
Epoch 15 MSE: 0.0011960119009017944
Epoch 16 MSE: 0.002275234553962946
Epoch 17 MSE: 0.00209730863571167
Epoch 18 MSE: 0.0013001244515180588
Epoch 19 MSE: 0.0008742795325815678
Epoch 20 MSE: 0.0010253657819703221
Epoch 21 MSE: 0.0012263153912499547
Epoch 22 MSE: 0.0009674275061115623
Epoch 23 MSE: 0.00036626734072342515
Epoch 24 MSE: 2.199248774559237e-05

```

Epoch 25 MSE: 0.000276678561931476
 Epoch 26 MSE: 0.0007096833433024585
 Epoch 27 MSE: 0.0007076485198922455
 Epoch 28 MSE: 0.0003773518546950072
 Epoch 29 MSE: 0.00023356100427918136
 Epoch 30 MSE: 0.0003572253917809576
 Epoch 31 MSE: 0.0004187347658444196
 Epoch 32 MSE: 0.0002599924337118864
 Epoch 33 MSE: 6.487038626801223e-05
 Epoch 34 MSE: 4.685270687332377e-05
 Epoch 35 MSE: 0.00018392264610156417
 Epoch 36 MSE: 0.00028856840799562633
 Epoch 37 MSE: 0.00025293664657510817
 Epoch 38 MSE: 0.00014842422388028353
 Epoch 39 MSE: 9.997732558986172e-05
 Epoch 40 MSE: 0.00013119098730385303
 Epoch 41 MSE: 0.00015975291898939759
 Epoch 42 MSE: 0.00011916370567632839
 Epoch 43 MSE: 4.474912566365674e-05
 Epoch 44 MSE: 2.1532297978410497e-05
 Epoch 45 MSE: 6.806514284107834e-05
 Epoch 46 MSE: 0.00011381167132640257
 Epoch 47 MSE: 0.00010091196600114927
 Epoch 48 MSE: 5.859638986294158e-05
 Epoch 49 MSE: 4.551849633571692e-05
 Epoch 50 MSE: 6.308012234512717e-05
 Epoch 51 MSE: 6.769868923583999e-05
 Epoch 52 MSE: 4.327630085754208e-05
 Epoch 53 MSE: 2.0194511307636276e-05
 Epoch 54 MSE: 2.5933199140126817e-05
 Epoch 55 MSE: 4.7540917876176536e-05
 Epoch 56 MSE: 5.4552918300032616e-05
 Epoch 57 MSE: 4.1355415305588394e-05
 Epoch 58 MSE: 2.8862797989859246e-05
 Epoch 59 MSE: 3.084530180785805e-05
 Epoch 60 MSE: 3.693790131364949e-05
 Epoch 61 MSE: 3.2422780350316316e-05
 Epoch 62 MSE: 2.1102938262629323e-05
 Epoch 63 MSE: 1.7991360437008552e-05
 Epoch 64 MSE: 2.5770119464141317e-05
 Epoch 65 MSE: 3.173542791046202e-05
 Epoch 66 MSE: 2.802823655656539e-05
 Epoch 67 MSE: 2.188076905440539e-05
 Epoch 68 MSE: 2.1766276404378004e-05
 Epoch 69 MSE: 2.457958908053115e-05
 Epoch 70 MSE: 2.3126533051254228e-05
 Epoch 71 MSE: 1.849148429755587e-05
 Epoch 72 MSE: 1.727827293507289e-05

```

Epoch 73 MSE: 2.052927993645426e-05
Epoch 74 MSE: 2.2747533876099624e-05
Epoch 75 MSE: 2.0996923922211863e-05
Epoch 76 MSE: 1.8605282093631104e-05
Epoch 77 MSE: 1.8796945369103923e-05
Epoch 78 MSE: 1.9834669728879817e-05
Epoch 79 MSE: 1.8893922970164567e-05
Epoch 80 MSE: 1.7019039660226554e-05
Epoch 81 MSE: 1.6985188267426565e-05
Epoch 82 MSE: 1.849424916144926e-05
Epoch 83 MSE: 1.89548318303423e-05
Epoch 84 MSE: 1.787653673090972e-05
Epoch 85 MSE: 1.7174419554066844e-05
Epoch 86 MSE: 1.757402060320601e-05
Epoch 87 MSE: 1.7728389138937928e-05
Epoch 88 MSE: 1.698232881608419e-05
Epoch 89 MSE: 1.645882184675429e-05
Epoch 90 MSE: 1.6893620340852067e-05
Epoch 91 MSE: 1.7405978724127635e-05
Epoch 92 MSE: 1.7158952687168494e-05
Epoch 93 MSE: 1.667603282839991e-05
Epoch 94 MSE: 1.668017102929298e-05
Epoch 95 MSE: 1.685604001977481e-05
Epoch 96 MSE: 1.664023511693813e-05
Epoch 97 MSE: 1.6302572475979105e-05
Epoch 98 MSE: 1.6365260307793505e-05
Epoch 99 MSE: 1.6629777746857144e-05
T-time: 53.44296097755432

```

```

=====
Train Score: 0.12 RMSE
=====
Validation Score: 1.49 RMSE
=====

```

```

=====
Time Step = 30 | Hidden States = 32 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.07188298553228378
Epoch 1 MSE: 0.053305916488170624
Epoch 2 MSE: 0.04246915504336357
Epoch 3 MSE: 0.028966883197426796
Epoch 4 MSE: 0.02870110236108303
Epoch 5 MSE: 0.028383148834109306
Epoch 6 MSE: 0.021043457090854645
Epoch 7 MSE: 0.011616728268563747
Epoch 8 MSE: 0.008804050274193287

```

Epoch	9	MSE:	0.010037313215434551
Epoch	10	MSE:	0.0026903352700173855
Epoch	11	MSE:	0.0025744056329131126
Epoch	12	MSE:	0.008982857689261436
Epoch	13	MSE:	0.004716330207884312
Epoch	14	MSE:	0.00032993112108670175
Epoch	15	MSE:	0.0012185352388769388
Epoch	16	MSE:	0.0032431792933493853
Epoch	17	MSE:	0.0033282649237662554
Epoch	18	MSE:	0.0024382546544075012
Epoch	19	MSE:	0.001991882687434554
Epoch	20	MSE:	0.0021021547727286816
Epoch	21	MSE:	0.0021033601369708776
Epoch	22	MSE:	0.0014963347930461168
Epoch	23	MSE:	0.0005372645100578666
Epoch	24	MSE:	0.00014023025869391859
Epoch	25	MSE:	0.0008262958726845682
Epoch	26	MSE:	0.0015983658377081156
Epoch	27	MSE:	0.0012770825996994972
Epoch	28	MSE:	0.0004601903783623129
Epoch	29	MSE:	0.0001586748257977888
Epoch	30	MSE:	0.00036582601023837924
Epoch	31	MSE:	0.0005807005218230188
Epoch	32	MSE:	0.0005612549721263349
Epoch	33	MSE:	0.0004233001091051847
Epoch	34	MSE:	0.0003709389711730182
Epoch	35	MSE:	0.000440480827819556
Epoch	36	MSE:	0.0004736969422083348
Epoch	37	MSE:	0.0003364176372997463
Epoch	38	MSE:	0.00011950251064263284
Epoch	39	MSE:	3.7810325011378154e-05
Epoch	40	MSE:	0.0001539487566333264
Epoch	41	MSE:	0.0003046983038075268
Epoch	42	MSE:	0.00031355046667158604
Epoch	43	MSE:	0.0001935863692779094
Epoch	44	MSE:	9.243858221452683e-05
Epoch	45	MSE:	8.912904741009697e-05
Epoch	46	MSE:	0.00012397044338285923
Epoch	47	MSE:	0.00012108691589673981
Epoch	48	MSE:	9.238821075996384e-05
Epoch	49	MSE:	9.046741615748033e-05
Epoch	50	MSE:	0.00011986259778495878
Epoch	51	MSE:	0.0001342788600595668
Epoch	52	MSE:	0.00010202200064668432
Epoch	53	MSE:	4.8537760449107736e-05
Epoch	54	MSE:	2.6892730602412485e-05
Epoch	55	MSE:	5.220639650360681e-05
Epoch	56	MSE:	8.371141302632168e-05

Epoch 57 MSE: 8.1736667198129e-05
Epoch 58 MSE: 5.729850090574473e-05
Epoch 59 MSE: 4.392337359604426e-05
Epoch 60 MSE: 4.720429933513515e-05
Epoch 61 MSE: 4.820691901841201e-05
Epoch 62 MSE: 3.945517892134376e-05
Epoch 63 MSE: 3.3896154491230845e-05
Epoch 64 MSE: 4.098954741493799e-05
Epoch 65 MSE: 5.045819125371054e-05
Epoch 66 MSE: 4.7121142415562645e-05
Epoch 67 MSE: 3.312211993033998e-05
Epoch 68 MSE: 2.4375502107432112e-05
Epoch 69 MSE: 2.8136710170656443e-05
Epoch 70 MSE: 3.5265002225060016e-05
Epoch 71 MSE: 3.555831790436059e-05
Epoch 72 MSE: 3.093710620305501e-05
Epoch 73 MSE: 2.8750295314239338e-05
Epoch 74 MSE: 2.9369322874117643e-05
Epoch 75 MSE: 2.801564369292464e-05
Epoch 76 MSE: 2.4668293917784467e-05
Epoch 77 MSE: 2.4040322387008928e-05
Epoch 78 MSE: 2.7047341063735075e-05
Epoch 79 MSE: 2.8982532967347652e-05
Epoch 80 MSE: 2.6729789169621654e-05
Epoch 81 MSE: 2.310210584255401e-05
Epoch 82 MSE: 2.2228561647352763e-05
Epoch 83 MSE: 2.376486918365117e-05
Epoch 84 MSE: 2.449627936584875e-05
Epoch 85 MSE: 2.3639911887585185e-05
Epoch 86 MSE: 2.3043798137223348e-05
Epoch 87 MSE: 2.3258959117811173e-05
Epoch 88 MSE: 2.2920017727301456e-05
Epoch 89 MSE: 2.1743075194535777e-05
Epoch 90 MSE: 2.1224190277280286e-05
Epoch 91 MSE: 2.198802940256428e-05
Epoch 92 MSE: 2.2660660761175677e-05
Epoch 93 MSE: 2.21135178435361e-05
Epoch 94 MSE: 2.111711546604056e-05
Epoch 95 MSE: 2.0854098693234846e-05
Epoch 96 MSE: 2.1143861886230297e-05
Epoch 97 MSE: 2.1160849428270012e-05
Epoch 98 MSE: 2.090117777697742e-05
Epoch 99 MSE: 2.085902087856084e-05
T-time: 87.9983274936676

=====
Train Score: 0.14 RMSE
=====

Validation Score: 4.19 RMSE

=====

=====

Time Step = 50 | Hidden States = 2 | Num Layers = 1

=====

Epoch	0	MSE:	0.0742608904838562
Epoch	1	MSE:	0.062009457498788834
Epoch	2	MSE:	0.052402522414922714
Epoch	3	MSE:	0.045642729848623276
Epoch	4	MSE:	0.041738227009773254
Epoch	5	MSE:	0.04032587260007858
Epoch	6	MSE:	0.04052198305726051
Epoch	7	MSE:	0.041090745478868484
Epoch	8	MSE:	0.041023656725883484
Epoch	9	MSE:	0.03993842750787735
Epoch	10	MSE:	0.03798532113432884
Epoch	11	MSE:	0.03556614741683006
Epoch	12	MSE:	0.0331113375723362
Epoch	13	MSE:	0.030954057350754738
Epoch	14	MSE:	0.029274750500917435
Epoch	15	MSE:	0.028094112873077393
Epoch	16	MSE:	0.027302978560328484
Epoch	17	MSE:	0.026717592030763626
Epoch	18	MSE:	0.026143185794353485
Epoch	19	MSE:	0.02542714774608612
Epoch	20	MSE:	0.02448938600718975
Epoch	21	MSE:	0.02332731895148754
Epoch	22	MSE:	0.022001022472977638
Epoch	23	MSE:	0.020607035607099533
Epoch	24	MSE:	0.019248509779572487
Epoch	25	MSE:	0.018007680773735046
Epoch	26	MSE:	0.016925673931837082
Epoch	27	MSE:	0.015994062647223473
Epoch	28	MSE:	0.015161242336034775
Epoch	29	MSE:	0.014352691359817982
Epoch	30	MSE:	0.01349872536957264
Epoch	31	MSE:	0.012559309601783752
Epoch	32	MSE:	0.011536355130374432
Epoch	33	MSE:	0.010469580069184303
Epoch	34	MSE:	0.00941889826208353
Epoch	35	MSE:	0.008441027253866196
Epoch	36	MSE:	0.007568986155092716
Epoch	37	MSE:	0.006801762618124485
Epoch	38	MSE:	0.006107857916504145
Epoch	39	MSE:	0.005441526882350445
Epoch	40	MSE:	0.004765074234455824

Epoch 41 MSE: 0.004067134577780962
 Epoch 42 MSE: 0.003368205623701215
 Epoch 43 MSE: 0.0027105938643217087
 Epoch 44 MSE: 0.002137619536370039
 Epoch 45 MSE: 0.0016724494053050876
 Epoch 46 MSE: 0.0013078540796414018
 Epoch 47 MSE: 0.001013146247714758
 Epoch 48 MSE: 0.0007547180284745991
 Epoch 49 MSE: 0.0005173117388039827
 Epoch 50 MSE: 0.00031182801467366517
 Epoch 51 MSE: 0.00016435561701655388
 Epoch 52 MSE: 9.411180508323014e-05
 Epoch 53 MSE: 9.608816617401317e-05
 Epoch 54 MSE: 0.00014141028805170208
 Epoch 55 MSE: 0.0001954312901943922
 Epoch 56 MSE: 0.0002391002344666049
 Epoch 57 MSE: 0.0002761791693046689
 Epoch 58 MSE: 0.00032142328564077616
 Epoch 59 MSE: 0.000381388672394678
 Epoch 60 MSE: 0.00044507411075755954
 Epoch 61 MSE: 0.0004917228361591697
 Epoch 62 MSE: 0.000507302291225642
 Epoch 63 MSE: 0.0004942384548485279
 Epoch 64 MSE: 0.000466716883238405
 Epoch 65 MSE: 0.00043762067798525095
 Epoch 66 MSE: 0.0004095132171642035
 Epoch 67 MSE: 0.00037655376945622265
 Epoch 68 MSE: 0.0003335348446853459
 Epoch 69 MSE: 0.0002826354466378689
 Epoch 70 MSE: 0.00023229036014527082
 Epoch 71 MSE: 0.0001905726094264537
 Epoch 72 MSE: 0.0001598070521140471
 Epoch 73 MSE: 0.00013669811596628278
 Epoch 74 MSE: 0.00011675847053993493
 Epoch 75 MSE: 9.846781176747754e-05
 Epoch 76 MSE: 8.379681094083935e-05
 Epoch 77 MSE: 7.547581481048837e-05
 Epoch 78 MSE: 7.401246693916619e-05
 Epoch 79 MSE: 7.705438474658877e-05
 Epoch 80 MSE: 8.122131112031639e-05
 Epoch 81 MSE: 8.445606363238767e-05
 Epoch 82 MSE: 8.688116213306785e-05
 Epoch 83 MSE: 8.975625678431243e-05
 Epoch 84 MSE: 9.376922389492393e-05
 Epoch 85 MSE: 9.821358980843797e-05
 Epoch 86 MSE: 0.00010157821088796481
 Epoch 87 MSE: 0.00010280330752721056
 Epoch 88 MSE: 0.00010201885015703738

```

Epoch 89 MSE: 0.00010021962953032926
Epoch 90 MSE: 9.831575152929872e-05
Epoch 91 MSE: 9.646139369579032e-05
Epoch 92 MSE: 9.418145782547072e-05
Epoch 93 MSE: 9.104422497330233e-05
Epoch 94 MSE: 8.719265315448865e-05
Epoch 95 MSE: 8.327599061885849e-05
Epoch 96 MSE: 7.99274566816166e-05
Epoch 97 MSE: 7.731818914180622e-05
Epoch 98 MSE: 7.517463382100686e-05
Epoch 99 MSE: 7.317050767596811e-05
T-time: 22.606600522994995

```

```

=====
Train Score: 0.26 RMSE
=====
Validation Score: 7.32 RMSE
=====

```

```

=====
Time Step = 50 | Hidden States = 2 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.04541259631514549
Epoch 1 MSE: 0.03939131274819374
Epoch 2 MSE: 0.0368654690682888
Epoch 3 MSE: 0.037087757140398026
Epoch 4 MSE: 0.0383160263299942
Epoch 5 MSE: 0.038955044001340866
Epoch 6 MSE: 0.03863745927810669
Epoch 7 MSE: 0.03774527087807655
Epoch 8 MSE: 0.0367855578660965
Epoch 9 MSE: 0.036126427352428436
Epoch 10 MSE: 0.035912469029426575
Epoch 11 MSE: 0.03606269136071205
Epoch 12 MSE: 0.03634500876069069
Epoch 13 MSE: 0.03651213273406029
Epoch 14 MSE: 0.03642547130584717
Epoch 15 MSE: 0.03609423711895943
Epoch 16 MSE: 0.035631660372018814
Epoch 17 MSE: 0.03517875447869301
Epoch 18 MSE: 0.03483660891652107
Epoch 19 MSE: 0.03462718799710274
Epoch 20 MSE: 0.034492239356040955
Epoch 21 MSE: 0.03432955965399742
Epoch 22 MSE: 0.03404823690652847
Epoch 23 MSE: 0.03361248970031738
Epoch 24 MSE: 0.03305217623710632

```

Epoch	25	MSE:	0.03243974968791008
Epoch	26	MSE:	0.0318482480943203
Epoch	27	MSE:	0.03130878880620003
Epoch	28	MSE:	0.030788147822022438
Epoch	29	MSE:	0.030206920579075813
Epoch	30	MSE:	0.0294948797672987
Epoch	31	MSE:	0.02864006720483303
Epoch	32	MSE:	0.027691246941685677
Epoch	33	MSE:	0.0267178975045681
Epoch	34	MSE:	0.025758620351552963
Epoch	35	MSE:	0.02479189820587635
Epoch	36	MSE:	0.02375401183962822
Epoch	37	MSE:	0.022596416994929314
Epoch	38	MSE:	0.021331127732992172
Epoch	39	MSE:	0.02001775987446308
Epoch	40	MSE:	0.018701227381825447
Epoch	41	MSE:	0.0173642635345459
Epoch	42	MSE:	0.015960650518536568
Epoch	43	MSE:	0.014493316411972046
Epoch	44	MSE:	0.013028870336711407
Epoch	45	MSE:	0.011624982580542564
Epoch	46	MSE:	0.01026271190494299
Epoch	47	MSE:	0.008899114094674587
Epoch	48	MSE:	0.007572100032120943
Epoch	49	MSE:	0.006375870667397976
Epoch	50	MSE:	0.005339101422578096
Epoch	51	MSE:	0.004427971784025431
Epoch	52	MSE:	0.0036777625791728497
Epoch	53	MSE:	0.0031449978705495596
Epoch	54	MSE:	0.002774723805487156
Epoch	55	MSE:	0.0025150699075311422
Epoch	56	MSE:	0.0024014662485569715
Epoch	57	MSE:	0.0023852514568716288
Epoch	58	MSE:	0.0023761659394949675
Epoch	59	MSE:	0.0023642589803785086
Epoch	60	MSE:	0.002316734055057168
Epoch	61	MSE:	0.00218418100848794
Epoch	62	MSE:	0.001981725450605154
Epoch	63	MSE:	0.0017408677376806736
Epoch	64	MSE:	0.0014765679370611906
Epoch	65	MSE:	0.001221781363710761
Epoch	66	MSE:	0.0010204464197158813
Epoch	67	MSE:	0.0008902896661311388
Epoch	68	MSE:	0.0008267884841188788
Epoch	69	MSE:	0.0008236982394009829
Epoch	70	MSE:	0.0008649679366499186
Epoch	71	MSE:	0.0009192405850626528
Epoch	72	MSE:	0.0009599656914360821

```

Epoch 73 MSE: 0.0009742029942572117
Epoch 74 MSE: 0.0009535006829537451
Epoch 75 MSE: 0.0008966558962129056
Epoch 76 MSE: 0.0008173260139301419
Epoch 77 MSE: 0.000734618166461587
Epoch 78 MSE: 0.000661471567582339
Epoch 79 MSE: 0.0006072524702176452
Epoch 80 MSE: 0.0005786964320577681
Epoch 81 MSE: 0.000572818098589778
Epoch 82 MSE: 0.0005797740304842591
Epoch 83 MSE: 0.0005915139336138964
Epoch 84 MSE: 0.0006001044530421495
Epoch 85 MSE: 0.0005975205567665398
Epoch 86 MSE: 0.0005821791710332036
Epoch 87 MSE: 0.0005570723442360759
Epoch 88 MSE: 0.0005253797280602157
Epoch 89 MSE: 0.0004926793626509607
Epoch 90 MSE: 0.0004650322371162474
Epoch 91 MSE: 0.00044461217476055026
Epoch 92 MSE: 0.00043173431186005473
Epoch 93 MSE: 0.00042577093699947
Epoch 94 MSE: 0.00042334513273090124
Epoch 95 MSE: 0.0004208330938126892
Epoch 96 MSE: 0.00041631911881268024
Epoch 97 MSE: 0.0004082377126906067
Epoch 98 MSE: 0.000396306422771886
Epoch 99 MSE: 0.0003821894933935255
T-time: 39.80460786819458

```

```

=====
Train Score: 0.58 RMSE
=====
Validation Score: 13.79 RMSE
=====

```

```

=====
Time Step = 50 | Hidden States = 4 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.10186194628477097
Epoch 1 MSE: 0.07823987305164337
Epoch 2 MSE: 0.05898590758442879
Epoch 3 MSE: 0.04390754550695419
Epoch 4 MSE: 0.03276057168841362
Epoch 5 MSE: 0.025204278528690338
Epoch 6 MSE: 0.02078968472778797
Epoch 7 MSE: 0.018969278782606125
Epoch 8 MSE: 0.01910502277314663

```

Epoch 9 MSE: 0.020486164838075638
 Epoch 10 MSE: 0.022384488955140114
 Epoch 11 MSE: 0.024150846526026726
 Epoch 12 MSE: 0.02531309984624386
 Epoch 13 MSE: 0.025624992325901985
 Epoch 14 MSE: 0.025051454082131386
 Epoch 15 MSE: 0.023713817819952965
 Epoch 16 MSE: 0.02182534523308277
 Epoch 17 MSE: 0.019635073840618134
 Epoch 18 MSE: 0.017385298386216164
 Epoch 19 MSE: 0.015282204374670982
 Epoch 20 MSE: 0.013477289117872715
 Epoch 21 MSE: 0.012057820335030556
 Epoch 22 MSE: 0.011045352555811405
 Epoch 23 MSE: 0.01040184311568737
 Epoch 24 MSE: 0.010042531415820122
 Epoch 25 MSE: 0.009853936731815338
 Epoch 26 MSE: 0.009714324027299881
 Epoch 27 MSE: 0.00951352622359991
 Epoch 28 MSE: 0.009169242344796658
 Epoch 29 MSE: 0.008637571707367897
 Epoch 30 MSE: 0.007916687987744808
 Epoch 31 MSE: 0.007043706253170967
 Epoch 32 MSE: 0.006085703149437904
 Epoch 33 MSE: 0.005126387346535921
 Epoch 34 MSE: 0.004250232595950365
 Epoch 35 MSE: 0.003526090644299984
 Epoch 36 MSE: 0.002992786932736635
 Epoch 37 MSE: 0.002649854402989149
 Epoch 38 MSE: 0.002456904388964176
 Epoch 39 MSE: 0.0023441677913069725
 Epoch 40 MSE: 0.0022333951201289892
 Epoch 41 MSE: 0.002063220599666238
 Epoch 42 MSE: 0.0018093287944793701
 Epoch 43 MSE: 0.0014906992437317967
 Epoch 44 MSE: 0.0011593223316594958
 Epoch 45 MSE: 0.0008781312499195337
 Epoch 46 MSE: 0.0006965015782043338
 Epoch 47 MSE: 0.0006327335140667856
 Epoch 48 MSE: 0.0006694822222925723
 Epoch 49 MSE: 0.0007627354934811592
 Epoch 50 MSE: 0.0008597656851634383
 Epoch 51 MSE: 0.0009183882502838969
 Epoch 52 MSE: 0.0009200652129948139
 Epoch 53 MSE: 0.0008725962834432721
 Epoch 54 MSE: 0.0008026273571886122
 Epoch 55 MSE: 0.0007419298053719103
 Epoch 56 MSE: 0.0007133356994017959

Epoch 57 MSE: 0.0007219052640721202
 Epoch 58 MSE: 0.0007546314154751599
 Epoch 59 MSE: 0.0007882255013100803
 Epoch 60 MSE: 0.0008007779251784086
 Epoch 61 MSE: 0.0007813904085196555
 Epoch 62 MSE: 0.0007334051188081503
 Epoch 63 MSE: 0.0006707143620587885
 Epoch 64 MSE: 0.0006101071485318244
 Epoch 65 MSE: 0.0005639077862724662
 Epoch 66 MSE: 0.0005360694485716522
 Epoch 67 MSE: 0.0005225985660217702
 Epoch 68 MSE: 0.0005151331424713135
 Epoch 69 MSE: 0.0005054703215137124
 Epoch 70 MSE: 0.0004889889969490469
 Epoch 71 MSE: 0.000465847784653306
 Epoch 72 MSE: 0.0004399677272886038
 Epoch 73 MSE: 0.00041666821925900877
 Epoch 74 MSE: 0.0004001675988547504
 Epoch 75 MSE: 0.0003919640730600804
 Epoch 76 MSE: 0.00039059584378264844
 Epoch 77 MSE: 0.00039263712824322283
 Epoch 78 MSE: 0.0003943225019611418
 Epoch 79 MSE: 0.00039302927325479686
 Epoch 80 MSE: 0.0003880359581671655
 Epoch 81 MSE: 0.0003803748986683786
 Epoch 82 MSE: 0.0003720048407558352
 Epoch 83 MSE: 0.00036477105459198356
 Epoch 84 MSE: 0.00035962165566161275
 Epoch 85 MSE: 0.0003563552745617926
 Epoch 86 MSE: 0.0003539053723216057
 Epoch 87 MSE: 0.00035094597842544317
 Epoch 88 MSE: 0.0003465068293735385
 Epoch 89 MSE: 0.0003403425798751414
 Epoch 90 MSE: 0.00033293815795332193
 Epoch 91 MSE: 0.0003252062597312033
 Epoch 92 MSE: 0.0003180535277351737
 Epoch 93 MSE: 0.0003120159381069243
 Epoch 94 MSE: 0.0003071112441830337
 Epoch 95 MSE: 0.00030293618328869343
 Epoch 96 MSE: 0.00029893004102632403
 Epoch 97 MSE: 0.00029466053820215166
 Epoch 98 MSE: 0.00029000089853070676
 Epoch 99 MSE: 0.00028513470897451043
 T-time: 20.523550033569336

=====
 Train Score: 0.50 RMSE
 =====

Validation Score: 11.79 RMSE

=====

=====

Time Step = 50 | Hidden States = 4 | Num Layers = 2

=====

Epoch	0	MSE:	0.14384600520133972
Epoch	1	MSE:	0.10968273878097534
Epoch	2	MSE:	0.08233783394098282
Epoch	3	MSE:	0.06209370866417885
Epoch	4	MSE:	0.04891606792807579
Epoch	5	MSE:	0.042443543672561646
Epoch	6	MSE:	0.0416816845536232
Epoch	7	MSE:	0.04459628462791443
Epoch	8	MSE:	0.04842166602611542
Epoch	9	MSE:	0.05089804157614708
Epoch	10	MSE:	0.051098182797431946
Epoch	11	MSE:	0.049226485192775726
Epoch	12	MSE:	0.04604518413543701
Epoch	13	MSE:	0.04241759702563286
Epoch	14	MSE:	0.039051592350006104
Epoch	15	MSE:	0.03639558330178261
Epoch	16	MSE:	0.03463265299797058
Epoch	17	MSE:	0.03372956067323685
Epoch	18	MSE:	0.03350715711712837
Epoch	19	MSE:	0.033710937947034836
Epoch	20	MSE:	0.034071095287799835
Epoch	21	MSE:	0.03434785455465317
Epoch	22	MSE:	0.03436176851391792
Epoch	23	MSE:	0.03401000425219536
Epoch	24	MSE:	0.03327026590704918
Epoch	25	MSE:	0.032194070518016815
Epoch	26	MSE:	0.030890915542840958
Epoch	27	MSE:	0.029505135491490364
Epoch	28	MSE:	0.028186889365315437
Epoch	29	MSE:	0.027059907093644142
Epoch	30	MSE:	0.026190517470240593
Epoch	31	MSE:	0.02556602843105793
Epoch	32	MSE:	0.02509238012135029
Epoch	33	MSE:	0.024618348106741905
Epoch	34	MSE:	0.023983754217624664
Epoch	35	MSE:	0.023075364530086517
Epoch	36	MSE:	0.0218676645308733
Epoch	37	MSE:	0.02043168433010578
Epoch	38	MSE:	0.018908845260739326
Epoch	39	MSE:	0.017458593472838402
Epoch	40	MSE:	0.01619502529501915

Epoch	41	MSE:	0.015131797641515732
Epoch	42	MSE:	0.014161237515509129
Epoch	43	MSE:	0.013095875270664692
Epoch	44	MSE:	0.011777439154684544
Epoch	45	MSE:	0.010198339819908142
Epoch	46	MSE:	0.008536726236343384
Epoch	47	MSE:	0.007049642037600279
Epoch	48	MSE:	0.0058788941241800785
Epoch	49	MSE:	0.004926740191876888
Epoch	50	MSE:	0.0039602587930858135
Epoch	51	MSE:	0.002893006894737482
Epoch	52	MSE:	0.0019445501966401935
Epoch	53	MSE:	0.0014397894265130162
Epoch	54	MSE:	0.0013574365293607116
Epoch	55	MSE:	0.0012640401255339384
Epoch	56	MSE:	0.001025806530378759
Epoch	57	MSE:	0.001051556901074946
Epoch	58	MSE:	0.0014692115364596248
Epoch	59	MSE:	0.0018008091719821095
Epoch	60	MSE:	0.0018521539168432355
Epoch	61	MSE:	0.001988617004826665
Epoch	62	MSE:	0.002245491137728095
Epoch	63	MSE:	0.0022356314584612846
Epoch	64	MSE:	0.0020225855987519026
Epoch	65	MSE:	0.001906359801068902
Epoch	66	MSE:	0.0018029940547421575
Epoch	67	MSE:	0.0015469786012545228
Epoch	68	MSE:	0.0012698880163952708
Epoch	69	MSE:	0.0011189949000254273
Epoch	70	MSE:	0.0010168581502512097
Epoch	71	MSE:	0.0008733635186217725
Epoch	72	MSE:	0.0007496094331145287
Epoch	73	MSE:	0.0007150981691665947
Epoch	74	MSE:	0.0007306472398340702
Epoch	75	MSE:	0.0007316793198697269
Epoch	76	MSE:	0.0007229496259242296
Epoch	77	MSE:	0.0007422671187669039
Epoch	78	MSE:	0.0007859919569455087
Epoch	79	MSE:	0.0008153397357091308
Epoch	80	MSE:	0.000815001199953258
Epoch	81	MSE:	0.0008066088776104152
Epoch	82	MSE:	0.0008070854819379747
Epoch	83	MSE:	0.0008038626983761787
Epoch	84	MSE:	0.0007795646670274436
Epoch	85	MSE:	0.0007405952201224864
Epoch	86	MSE:	0.0007062567165121436
Epoch	87	MSE:	0.0006803469732403755
Epoch	88	MSE:	0.0006507635116577148

Epoch 89 MSE: 0.0006140907644294202
Epoch 90 MSE: 0.0005826511769555509
Epoch 91 MSE: 0.0005643551121465862
Epoch 92 MSE: 0.0005516782985068858
Epoch 93 MSE: 0.0005370522849261761
Epoch 94 MSE: 0.0005254466668702662
Epoch 95 MSE: 0.0005229602684266865
Epoch 96 MSE: 0.000524309347383678
Epoch 97 MSE: 0.0005217652069404721
Epoch 98 MSE: 0.0005171464290469885
Epoch 99 MSE: 0.000515017076395452
T-time: 41.557682514190674

=====

Train Score: 0.68 RMSE

=====

Validation Score: 12.78 RMSE

=====

=====

Time Step = 50 | Hidden States = 8 | Num Layers = 1

=====

Epoch 0 MSE: 0.213391974568367
Epoch 1 MSE: 0.16463464498519897
Epoch 2 MSE: 0.12429853528738022
Epoch 3 MSE: 0.09204477071762085
Epoch 4 MSE: 0.06758939474821091
Epoch 5 MSE: 0.05052864924073219
Epoch 6 MSE: 0.04030289500951767
Epoch 7 MSE: 0.036104343831539154
Epoch 8 MSE: 0.036680180579423904
Epoch 9 MSE: 0.04011410474777222
Epoch 10 MSE: 0.04406619071960449
Epoch 11 MSE: 0.04668243229389191
Epoch 12 MSE: 0.04717293381690979
Epoch 13 MSE: 0.04563504830002785
Epoch 14 MSE: 0.04263104870915413
Epoch 15 MSE: 0.03885074332356453
Epoch 16 MSE: 0.03491348400712013
Epoch 17 MSE: 0.031278591603040695
Epoch 18 MSE: 0.02822497859597206
Epoch 19 MSE: 0.02586975507438183
Epoch 20 MSE: 0.024204744026064873
Epoch 21 MSE: 0.02313733473420143
Epoch 22 MSE: 0.022527823224663734
Epoch 23 MSE: 0.022219577804207802
Epoch 24 MSE: 0.022061171010136604

Epoch	25	MSE:	0.021921100094914436
Epoch	26	MSE:	0.021696388721466064
Epoch	27	MSE:	0.02131631411612034
Epoch	28	MSE:	0.020742515102028847
Epoch	29	MSE:	0.01996641419827938
Epoch	30	MSE:	0.01900477521121502
Epoch	31	MSE:	0.017894035205245018
Epoch	32	MSE:	0.016683897003531456
Epoch	33	MSE:	0.015430571511387825
Epoch	34	MSE:	0.01419011503458023
Epoch	35	MSE:	0.013012104667723179
Epoch	36	MSE:	0.011934122070670128
Epoch	37	MSE:	0.010977529920637608
Epoch	38	MSE:	0.010145128704607487
Epoch	39	MSE:	0.00942131970077753
Epoch	40	MSE:	0.008775202557444572
Epoch	41	MSE:	0.00816663820296526
Epoch	42	MSE:	0.007554557174444199
Epoch	43	MSE:	0.006905983202159405
Epoch	44	MSE:	0.006203679367899895
Epoch	45	MSE:	0.0054503437131643295
Epoch	46	MSE:	0.004668035078793764
Epoch	47	MSE:	0.003892790526151657
Epoch	48	MSE:	0.003165828762575984
Epoch	49	MSE:	0.0025236038491129875
Epoch	50	MSE:	0.0019893913995474577
Epoch	51	MSE:	0.0015685590915381908
Epoch	52	MSE:	0.001248756772838533
Epoch	53	MSE:	0.0010049211559817195
Epoch	54	MSE:	0.0008076591184362769
Epoch	55	MSE:	0.0006325385766103864
Epoch	56	MSE:	0.0004673876101151109
Epoch	57	MSE:	0.00031513921567238867
Epoch	58	MSE:	0.00019099382916465402
Epoch	59	MSE:	0.00011452077160356566
Epoch	60	MSE:	9.932957618730143e-05
Epoch	61	MSE:	0.00014446552086155862
Epoch	62	MSE:	0.0002318117331014946
Epoch	63	MSE:	0.0003316478687338531
Epoch	64	MSE:	0.00041435190360061824
Epoch	65	MSE:	0.0004622379201464355
Epoch	66	MSE:	0.0004749165673274547
Epoch	67	MSE:	0.00046549565740861
Epoch	68	MSE:	0.0004506997065618634
Epoch	69	MSE:	0.00044124500709585845
Epoch	70	MSE:	0.0004376108990982175
Epoch	71	MSE:	0.00043229246512055397
Epoch	72	MSE:	0.00041590313776396215

```

Epoch 73 MSE: 0.00038310952368192375
Epoch 74 MSE: 0.00033544166944921017
Epoch 75 MSE: 0.00028024439234286547
Epoch 76 MSE: 0.0002270282420795411
Epoch 77 MSE: 0.00018340452515985817
Epoch 78 MSE: 0.00015253140009008348
Epoch 79 MSE: 0.0001329386286670342
Epoch 80 MSE: 0.00012035632971674204
Epoch 81 MSE: 0.00011032064503524452
Epoch 82 MSE: 0.00010020674380939454
Epoch 83 MSE: 8.988693298306316e-05
Epoch 84 MSE: 8.103111758828163e-05
Epoch 85 MSE: 7.569688750663772e-05
Epoch 86 MSE: 7.503473170800135e-05
Epoch 87 MSE: 7.867824024287984e-05
Epoch 88 MSE: 8.495114161632955e-05
Epoch 89 MSE: 9.162792412098497e-05
Epoch 90 MSE: 9.681081428425387e-05
Epoch 91 MSE: 9.953002154361457e-05
Epoch 92 MSE: 9.987034718506038e-05
Epoch 93 MSE: 9.866031177807599e-05
Epoch 94 MSE: 9.693140600575134e-05
Epoch 95 MSE: 9.541546023683622e-05
Epoch 96 MSE: 9.42847691476345e-05
Epoch 97 MSE: 9.320754907093942e-05
Epoch 98 MSE: 9.163795039057732e-05
Epoch 99 MSE: 8.916806109482422e-05
T-time: 25.852683544158936

```

```

=====
Train Score: 0.28 RMSE
=====
Validation Score: 6.64 RMSE
=====

```

```

=====
Time Step = 50 | Hidden States = 8 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.037010837346315384
Epoch 1 MSE: 0.03321288153529167
Epoch 2 MSE: 0.0337478406727314
Epoch 3 MSE: 0.029266145080327988
Epoch 4 MSE: 0.026534538716077805
Epoch 5 MSE: 0.026288606226444244
Epoch 6 MSE: 0.02467179298400879
Epoch 7 MSE: 0.02082986757159233
Epoch 8 MSE: 0.017290523275732994

```

Epoch 9 MSE: 0.015460016205906868
 Epoch 10 MSE: 0.013202928006649017
 Epoch 11 MSE: 0.00913295615464449
 Epoch 12 MSE: 0.005645491182804108
 Epoch 13 MSE: 0.004255844745784998
 Epoch 14 MSE: 0.002123628044500947
 Epoch 15 MSE: 0.0001688141783233732
 Epoch 16 MSE: 0.0018716733902692795
 Epoch 17 MSE: 0.002205652417615056
 Epoch 18 MSE: 0.0033757060300558805
 Epoch 19 MSE: 0.004814759362488985
 Epoch 20 MSE: 0.0035370897967368364
 Epoch 21 MSE: 0.003258420852944255
 Epoch 22 MSE: 0.0022498813923448324
 Epoch 23 MSE: 0.0008119334816001356
 Epoch 24 MSE: 0.0005653786356560886
 Epoch 25 MSE: 0.0004940726212225854
 Epoch 26 MSE: 0.0002682384510990232
 Epoch 27 MSE: 0.0005089208134450018
 Epoch 28 MSE: 0.000986872473731637
 Epoch 29 MSE: 0.0011527661699801683
 Epoch 30 MSE: 0.001129013136960566
 Epoch 31 MSE: 0.0012218287447467446
 Epoch 32 MSE: 0.0012900212313979864
 Epoch 33 MSE: 0.0010975541081279516
 Epoch 34 MSE: 0.000796231091953814
 Epoch 35 MSE: 0.0006297420477494597
 Epoch 36 MSE: 0.0005045545403845608
 Epoch 37 MSE: 0.00027684145607054234
 Epoch 38 MSE: 0.00012432601943146437
 Epoch 39 MSE: 0.00017199129797518253
 Epoch 40 MSE: 0.0002224078489234671
 Epoch 41 MSE: 0.00022841317695565522
 Epoch 42 MSE: 0.00034018460428342223
 Epoch 43 MSE: 0.00043663798714987934
 Epoch 44 MSE: 0.0003961579641327262
 Epoch 45 MSE: 0.00036537539563141763
 Epoch 46 MSE: 0.00034062322811223567
 Epoch 47 MSE: 0.00023396995675284415
 Epoch 48 MSE: 0.00015333468036260456
 Epoch 49 MSE: 0.00014053948689252138
 Epoch 50 MSE: 0.00011315897427266464
 Epoch 51 MSE: 9.78902680799365e-05
 Epoch 52 MSE: 0.00013601301179733127
 Epoch 53 MSE: 0.0001664623705437407
 Epoch 54 MSE: 0.00016831998073030263
 Epoch 55 MSE: 0.00018194038420915604
 Epoch 56 MSE: 0.0001905393146444112

Epoch 57 MSE: 0.0001655233500059694
Epoch 58 MSE: 0.00013957562623545527
Epoch 59 MSE: 0.00012728308502119035
Epoch 60 MSE: 0.00010425124492030591
Epoch 61 MSE: 8.473471825709566e-05
Epoch 62 MSE: 8.8421547843609e-05
Epoch 63 MSE: 9.201021020999178e-05
Epoch 64 MSE: 9.264348773285747e-05
Epoch 65 MSE: 0.00010515114263398573
Epoch 66 MSE: 0.00011120013368781656
Epoch 67 MSE: 0.00010561865929048508
Epoch 68 MSE: 0.00010390443640062585
Epoch 69 MSE: 9.745809074956924e-05
Epoch 70 MSE: 8.486147999064997e-05
Epoch 71 MSE: 7.996158819878474e-05
Epoch 72 MSE: 7.711989019298926e-05
Epoch 73 MSE: 7.314790855161846e-05
Epoch 74 MSE: 7.582421676488593e-05
Epoch 75 MSE: 7.919863128336146e-05
Epoch 76 MSE: 7.895671296864748e-05
Epoch 77 MSE: 8.046561561059207e-05
Epoch 78 MSE: 8.027001604204997e-05
Epoch 79 MSE: 7.612636545673013e-05
Epoch 80 MSE: 7.347397331614047e-05
Epoch 81 MSE: 7.08797961124219e-05
Epoch 82 MSE: 6.716766074532643e-05
Epoch 83 MSE: 6.632897566305473e-05
Epoch 84 MSE: 6.636278703808784e-05
Epoch 85 MSE: 6.577189196832478e-05
Epoch 86 MSE: 6.674491305602714e-05
Epoch 87 MSE: 6.694368494208902e-05
Epoch 88 MSE: 6.576471059815958e-05
Epoch 89 MSE: 6.510317325592041e-05
Epoch 90 MSE: 6.348035094561055e-05
Epoch 91 MSE: 6.15097233094275e-05
Epoch 92 MSE: 6.059315273887478e-05
Epoch 93 MSE: 5.947193130850792e-05
Epoch 94 MSE: 5.8764264394994825e-05
Epoch 95 MSE: 5.878494994249195e-05
Epoch 96 MSE: 5.829200745210983e-05
Epoch 97 MSE: 5.7840887166094035e-05
Epoch 98 MSE: 5.733964280807413e-05
Epoch 99 MSE: 5.616895577986725e-05
T-time: 47.4135377407074

=====
Train Score: 0.22 RMSE
=====

Validation Score: 6.16 RMSE

=====

=====

Time Step = 50 | Hidden States = 16 | Num Layers = 1

=====

Epoch	0	MSE:	0.06670422106981277
Epoch	1	MSE:	0.04410930722951889
Epoch	2	MSE:	0.03354153409600258
Epoch	3	MSE:	0.0332847535610199
Epoch	4	MSE:	0.03537086024880409
Epoch	5	MSE:	0.03372766077518463
Epoch	6	MSE:	0.029546087607741356
Epoch	7	MSE:	0.025463104248046875
Epoch	8	MSE:	0.022822828963398933
Epoch	9	MSE:	0.021657755598425865
Epoch	10	MSE:	0.0212395079433918
Epoch	11	MSE:	0.02064855769276619
Epoch	12	MSE:	0.019297458231449127
Epoch	13	MSE:	0.017162589356303215
Epoch	14	MSE:	0.014648769982159138
Epoch	15	MSE:	0.012312904931604862
Epoch	16	MSE:	0.010577094741165638
Epoch	17	MSE:	0.00946669653058052
Epoch	18	MSE:	0.008523735217750072
Epoch	19	MSE:	0.007150912191718817
Epoch	20	MSE:	0.005168793257325888
Epoch	21	MSE:	0.003017059527337551
Epoch	22	MSE:	0.0014792331494390965
Epoch	23	MSE:	0.0010633869096636772
Epoch	24	MSE:	0.0013044110964983702
Epoch	25	MSE:	0.0011964845471084118
Epoch	26	MSE:	0.0008614440448582172
Epoch	27	MSE:	0.001364306197501719
Epoch	28	MSE:	0.0025119937490671873
Epoch	29	MSE:	0.0027323137037456036
Epoch	30	MSE:	0.0019408782245591283
Epoch	31	MSE:	0.001262873993255198
Epoch	32	MSE:	0.0010671233758330345
Epoch	33	MSE:	0.0009074803092516959
Epoch	34	MSE:	0.00054645084310323
Epoch	35	MSE:	0.00018881050345953554
Epoch	36	MSE:	6.946093344595283e-05
Epoch	37	MSE:	0.00018855441885534674
Epoch	38	MSE:	0.00037331186467781663
Epoch	39	MSE:	0.0004738337593153119
Epoch	40	MSE:	0.00047157699009403586

Epoch 41 MSE: 0.000440188217908144
Epoch 42 MSE: 0.0004459950141608715
Epoch 43 MSE: 0.0004889605916105211
Epoch 44 MSE: 0.0005173585377633572
Epoch 45 MSE: 0.0004843252245336771
Epoch 46 MSE: 0.00039095443207770586
Epoch 47 MSE: 0.00028244638815522194
Epoch 48 MSE: 0.00020671087258961052
Epoch 49 MSE: 0.00017480204405728728
Epoch 50 MSE: 0.00015899950813036412
Epoch 51 MSE: 0.0001286450569750741
Epoch 52 MSE: 8.512803469784558e-05
Epoch 53 MSE: 5.8096044085687026e-05
Epoch 54 MSE: 6.893897807458416e-05
Epoch 55 MSE: 0.00010484312224434689
Epoch 56 MSE: 0.00013304762251209468
Epoch 57 MSE: 0.0001364127529086545
Epoch 58 MSE: 0.00012712806346826255
Epoch 59 MSE: 0.0001251383073395118
Epoch 60 MSE: 0.00013172515900805593
Epoch 61 MSE: 0.00013093158486299217
Epoch 62 MSE: 0.00011294266732875258
Epoch 63 MSE: 8.690358663443476e-05
Epoch 64 MSE: 6.89111475367099e-05
Epoch 65 MSE: 6.391673377947882e-05
Epoch 66 MSE: 6.379780825227499e-05
Epoch 67 MSE: 6.015361941535957e-05
Epoch 68 MSE: 5.396160850068554e-05
Epoch 69 MSE: 5.2006460464326665e-05
Epoch 70 MSE: 5.712340498575941e-05
Epoch 71 MSE: 6.468783976742998e-05
Epoch 72 MSE: 6.82859099470079e-05
Epoch 73 MSE: 6.657113408436999e-05
Epoch 74 MSE: 6.335927173495293e-05
Epoch 75 MSE: 6.208896957105026e-05
Epoch 76 MSE: 6.197501352289692e-05
Epoch 77 MSE: 5.9951518778689206e-05
Epoch 78 MSE: 5.511193012353033e-05
Epoch 79 MSE: 4.994252958567813e-05
Epoch 80 MSE: 4.726008410216309e-05
Epoch 81 MSE: 4.7076446207938716e-05
Epoch 82 MSE: 4.720207289210521e-05
Epoch 83 MSE: 4.633822391042486e-05
Epoch 84 MSE: 4.5443070121109486e-05
Epoch 85 MSE: 4.590761091094464e-05
Epoch 86 MSE: 4.7400306357303634e-05
Epoch 87 MSE: 4.828372402698733e-05
Epoch 88 MSE: 4.77267058158759e-05


```

Epoch 89 MSE: 4.6521960030077025e-05
Epoch 90 MSE: 4.574791819322854e-05
Epoch 91 MSE: 4.5370154111878946e-05
Epoch 92 MSE: 4.4614022044697776e-05
Epoch 93 MSE: 4.328187060309574e-05
Epoch 94 MSE: 4.2062874854309484e-05
Epoch 95 MSE: 4.156781142228283e-05
Epoch 96 MSE: 4.158689625910483e-05
Epoch 97 MSE: 4.1519233491271734e-05
Epoch 98 MSE: 4.11996225011535e-05
Epoch 99 MSE: 4.096625343663618e-05
T-time: 40.462799072265625

```

```

=====
Train Score: 0.19 RMSE
=====
Validation Score: 4.36 RMSE
=====

```

```

=====
Time Step = 50 | Hidden States = 16 | Num Layers = 2
=====

```

```

Epoch 0 MSE: 0.12359856814146042
Epoch 1 MSE: 0.06420028954744339
Epoch 2 MSE: 0.03495670482516289
Epoch 3 MSE: 0.03407468646764755
Epoch 4 MSE: 0.044979773461818695
Epoch 5 MSE: 0.04342009499669075
Epoch 6 MSE: 0.03547918424010277
Epoch 7 MSE: 0.02935691736638546
Epoch 8 MSE: 0.027183981612324715
Epoch 9 MSE: 0.02763543836772442
Epoch 10 MSE: 0.028591830283403397
Epoch 11 MSE: 0.028492946177721024
Epoch 12 MSE: 0.02680928446352482
Epoch 13 MSE: 0.02381308563053608
Epoch 14 MSE: 0.0201732125133276
Epoch 15 MSE: 0.016663968563079834
Epoch 16 MSE: 0.013939390890300274
Epoch 17 MSE: 0.012191065587103367
Epoch 18 MSE: 0.010706016793847084
Epoch 19 MSE: 0.008161318488419056
Epoch 20 MSE: 0.0042051286436617374
Epoch 21 MSE: 0.0007060931529849768
Epoch 22 MSE: 0.0009808068862184882
Epoch 23 MSE: 0.00479612872004509
Epoch 24 MSE: 0.005596034228801727

```

Epoch	25	MSE:	0.0036658067256212234
Epoch	26	MSE:	0.0026293478440493345
Epoch	27	MSE:	0.002381344325840473
Epoch	28	MSE:	0.001551461056806147
Epoch	29	MSE:	0.0006006614421494305
Epoch	30	MSE:	0.00037079761386848986
Epoch	31	MSE:	0.0008642704924568534
Epoch	32	MSE:	0.0015552558470517397
Epoch	33	MSE:	0.001967228716239333
Epoch	34	MSE:	0.0019263532012701035
Epoch	35	MSE:	0.001544912694953382
Epoch	36	MSE:	0.001083218608982861
Epoch	37	MSE:	0.0007742731831967831
Epoch	38	MSE:	0.0006770070758648217
Epoch	39	MSE:	0.0006536292494274676
Epoch	40	MSE:	0.0005291432607918978
Epoch	41	MSE:	0.00030283816158771515
Epoch	42	MSE:	0.00015986734069883823
Epoch	43	MSE:	0.0002479150425642729
Epoch	44	MSE:	0.0004882090725004673
Epoch	45	MSE:	0.0006513199186883867
Epoch	46	MSE:	0.0005990623612888157
Epoch	47	MSE:	0.00040465156780555844
Epoch	48	MSE:	0.00023996188247110695
Epoch	49	MSE:	0.0001912784209707752
Epoch	50	MSE:	0.00020731246331706643
Epoch	51	MSE:	0.00020164081070106477
Epoch	52	MSE:	0.0001591081963852048
Epoch	53	MSE:	0.00012966804206371307
Epoch	54	MSE:	0.00015203333168756217
Epoch	55	MSE:	0.00020931148901581764
Epoch	56	MSE:	0.0002504432341083884
Epoch	57	MSE:	0.00023942238476593047
Epoch	58	MSE:	0.0001837718882597983
Epoch	59	MSE:	0.0001231333299074322
Epoch	60	MSE:	9.259096259484068e-05
Epoch	61	MSE:	9.419534035259858e-05
Epoch	62	MSE:	0.0001027555699693039
Epoch	63	MSE:	9.820392733672634e-05
Epoch	64	MSE:	8.681514736963436e-05
Epoch	65	MSE:	8.740092016523704e-05
Epoch	66	MSE:	0.00010335369006497785
Epoch	67	MSE:	0.00011706155783031136
Epoch	68	MSE:	0.00011116109817521647
Epoch	69	MSE:	8.819955110084265e-05
Epoch	70	MSE:	6.633884186157957e-05
Epoch	71	MSE:	5.917047383263707e-05
Epoch	72	MSE:	6.386073800968006e-05

```
Epoch 73 MSE: 6.865447357995436e-05
Epoch 74 MSE: 6.754697096766904e-05
Epoch 75 MSE: 6.448938802350312e-05
Epoch 76 MSE: 6.516426947200671e-05
Epoch 77 MSE: 6.880205910420045e-05
Epoch 78 MSE: 6.950528040761128e-05
Epoch 79 MSE: 6.382565334206447e-05
Epoch 80 MSE: 5.499624239746481e-05
Epoch 81 MSE: 4.932523734169081e-05
Epoch 82 MSE: 4.944323518429883e-05
Epoch 83 MSE: 5.224691267358139e-05
Epoch 84 MSE: 5.336087997420691e-05
Epoch 85 MSE: 5.206735659157857e-05
Epoch 86 MSE: 5.080754272057675e-05
Epoch 87 MSE: 5.096761742606759e-05
Epoch 88 MSE: 5.104799856781028e-05
Epoch 89 MSE: 4.915408499073237e-05
Epoch 90 MSE: 4.5832715841243044e-05
Epoch 91 MSE: 4.347047070041299e-05
Epoch 92 MSE: 4.3390704377088696e-05
Epoch 93 MSE: 4.4510437874123454e-05
Epoch 94 MSE: 4.495759276323952e-05
Epoch 95 MSE: 4.4232350774109364e-05
Epoch 96 MSE: 4.326322232373059e-05
Epoch 97 MSE: 4.278525375411846e-05
Epoch 98 MSE: 4.243211151333526e-05
Epoch 99 MSE: 4.1532806790200993e-05
T-time: 72.54988217353821
```

```
=====
Train Score: 0.19 RMSE
=====
Validation Score: 7.11 RMSE
=====
```

```
=====
Time Step = 50 | Hidden States = 32 | Num Layers = 1
=====
```

```
Epoch 0 MSE: 0.04294290021061897
Epoch 1 MSE: 0.03275536000728607
Epoch 2 MSE: 0.03130323067307472
Epoch 3 MSE: 0.025067200884222984
Epoch 4 MSE: 0.019294526427984238
Epoch 5 MSE: 0.016042781993746758
Epoch 6 MSE: 0.012434117496013641
Epoch 7 MSE: 0.006264178082346916
Epoch 8 MSE: 0.0013224146096035838
```

Epoch 9 MSE: 0.005399370566010475
 Epoch 10 MSE: 0.003157021477818489
 Epoch 11 MSE: 0.0034628286957740784
 Epoch 12 MSE: 0.0036870394833385944
 Epoch 13 MSE: 0.0012062157038599253
 Epoch 14 MSE: 0.00012317951768636703
 Epoch 15 MSE: 0.00118175835814327
 Epoch 16 MSE: 0.0022701947018504143
 Epoch 17 MSE: 0.0021045487374067307
 Epoch 18 MSE: 0.0013053673319518566
 Epoch 19 MSE: 0.0008686492219567299
 Epoch 20 MSE: 0.0010138127254322171
 Epoch 21 MSE: 0.0012196379248052835
 Epoch 22 MSE: 0.0009697508066892624
 Epoch 23 MSE: 0.0003716018982231617
 Epoch 24 MSE: 2.2224812710192055e-05
 Epoch 25 MSE: 0.00027177445008419454
 Epoch 26 MSE: 0.000707500206772238
 Epoch 27 MSE: 0.0007111606537364423
 Epoch 28 MSE: 0.00037999547203071415
 Epoch 29 MSE: 0.00023022553068585694
 Epoch 30 MSE: 0.0003515265416353941
 Epoch 31 MSE: 0.0004168588202446699
 Epoch 32 MSE: 0.0002623563923407346
 Epoch 33 MSE: 6.693109025945887e-05
 Epoch 34 MSE: 4.565603376249783e-05
 Epoch 35 MSE: 0.0001812894770409912
 Epoch 36 MSE: 0.0002878155210055411
 Epoch 37 MSE: 0.00025433505652472377
 Epoch 38 MSE: 0.00014933508646208793
 Epoch 39 MSE: 9.858058183453977e-05
 Epoch 40 MSE: 0.00012861429422628134
 Epoch 41 MSE: 0.00015837156388442963
 Epoch 42 MSE: 0.00011964613804593682
 Epoch 43 MSE: 4.552215978037566e-05
 Epoch 44 MSE: 2.1053714590379968e-05
 Epoch 45 MSE: 6.680025398964062e-05
 Epoch 46 MSE: 0.00011329409608151764
 Epoch 47 MSE: 0.00010137206118088216
 Epoch 48 MSE: 5.8736532082548365e-05
 Epoch 49 MSE: 4.456158058019355e-05
 Epoch 50 MSE: 6.182891229400411e-05
 Epoch 51 MSE: 6.724114791722968e-05
 Epoch 52 MSE: 4.35050023952499e-05
 Epoch 53 MSE: 2.0180417777737603e-05
 Epoch 54 MSE: 2.531989048293326e-05
 Epoch 55 MSE: 4.6904158807592466e-05
 Epoch 56 MSE: 5.440649692900479e-05

Epoch 57 MSE: 4.1407991375308484e-05
Epoch 58 MSE: 2.8539008781081066e-05
Epoch 59 MSE: 3.0146729841362685e-05
Epoch 60 MSE: 3.638034104369581e-05
Epoch 61 MSE: 3.226367698516697e-05
Epoch 62 MSE: 2.103411861753557e-05
Epoch 63 MSE: 1.766947934811469e-05
Epoch 64 MSE: 2.5313909645774402e-05
Epoch 65 MSE: 3.1460174795938656e-05
Epoch 66 MSE: 2.7915850296267308e-05
Epoch 67 MSE: 2.1643580112140626e-05
Epoch 68 MSE: 2.1331163225113414e-05
Epoch 69 MSE: 2.418028270767536e-05
Epoch 70 MSE: 2.291466989845503e-05
Epoch 71 MSE: 1.833084024838172e-05
Epoch 72 MSE: 1.700297070783563e-05
Epoch 73 MSE: 2.0197234334773384e-05
Epoch 74 MSE: 2.2502872525365092e-05
Epoch 75 MSE: 2.0820369172724895e-05
Epoch 76 MSE: 1.8364748029853217e-05
Epoch 77 MSE: 1.847492421802599e-05
Epoch 78 MSE: 1.9544700990081765e-05
Epoch 79 MSE: 1.8688551790546626e-05
Epoch 80 MSE: 1.682108086242806e-05
Epoch 81 MSE: 1.6732654330553487e-05
Epoch 82 MSE: 1.823484490159899e-05
Epoch 83 MSE: 1.874435656645801e-05
Epoch 84 MSE: 1.7679976735962555e-05
Epoch 85 MSE: 1.6936592146521434e-05
Epoch 86 MSE: 1.7316773664788343e-05
Epoch 87 MSE: 1.7505795767647214e-05
Epoch 88 MSE: 1.678896660450846e-05
Epoch 89 MSE: 1.6250411135843024e-05
Epoch 90 MSE: 1.6667063391651027e-05
Epoch 91 MSE: 1.719502870400902e-05
Epoch 92 MSE: 1.6967635019682348e-05
Epoch 93 MSE: 1.6474803487653844e-05
Epoch 94 MSE: 1.6462245184811763e-05
Epoch 95 MSE: 1.66471454576822e-05
Epoch 96 MSE: 1.6450934708700515e-05
Epoch 97 MSE: 1.6113766832859255e-05
Epoch 98 MSE: 1.6166337445611134e-05
Epoch 99 MSE: 1.6434723875136115e-05
T-time: 70.90877223014832

=====
Train Score: 0.12 RMSE
=====

Validation Score: 1.50 RMSE

=====

=====

Time Step = 50 | Hidden States = 32 | Num Layers = 2

=====

Epoch	0	MSE:	0.07202881574630737
Epoch	1	MSE:	0.053314320743083954
Epoch	2	MSE:	0.042539481073617935
Epoch	3	MSE:	0.029014969244599342
Epoch	4	MSE:	0.02872292511165142
Epoch	5	MSE:	0.028398748487234116
Epoch	6	MSE:	0.021048905327916145
Epoch	7	MSE:	0.01160453911870718
Epoch	8	MSE:	0.008795571513473988
Epoch	9	MSE:	0.010022700764238834
Epoch	10	MSE:	0.0026613923255354166
Epoch	11	MSE:	0.002630762290209532
Epoch	12	MSE:	0.008983899839222431
Epoch	13	MSE:	0.004667961969971657
Epoch	14	MSE:	0.00031647970899939537
Epoch	15	MSE:	0.0012351266341283917
Epoch	16	MSE:	0.0032555011566728354
Epoch	17	MSE:	0.003326309146359563
Epoch	18	MSE:	0.002430360997095704
Epoch	19	MSE:	0.0019862183835357428
Epoch	20	MSE:	0.002099730307236314
Epoch	21	MSE:	0.0020998921245336533
Epoch	22	MSE:	0.0014887277502566576
Epoch	23	MSE:	0.0005296168383210897
Epoch	24	MSE:	0.00014128904149401933
Epoch	25	MSE:	0.0008350773132406175
Epoch	26	MSE:	0.0016005054349079728
Epoch	27	MSE:	0.0012693683383986354
Epoch	28	MSE:	0.0004536696942523122
Epoch	29	MSE:	0.00015882925072219223
Epoch	30	MSE:	0.00036899358383379877
Epoch	31	MSE:	0.0005819723010063171
Epoch	32	MSE:	0.0005594798130914569
Epoch	33	MSE:	0.0004207526217214763
Epoch	34	MSE:	0.00037013686960563064
Epoch	35	MSE:	0.00044129276648163795
Epoch	36	MSE:	0.00047366993385367095
Epoch	37	MSE:	0.000334256881615147
Epoch	38	MSE:	0.00011708511738106608
Epoch	39	MSE:	3.76287498511374e-05
Epoch	40	MSE:	0.00015565473586320877

Epoch 41 MSE: 0.0003056139685213566
Epoch 42 MSE: 0.00031220243545249104
Epoch 43 MSE: 0.00019139598589390516
Epoch 44 MSE: 9.156723535852507e-05
Epoch 45 MSE: 8.967162284534425e-05
Epoch 46 MSE: 0.00012428844638634473
Epoch 47 MSE: 0.00012035351392114535
Epoch 48 MSE: 9.144780051428825e-05
Epoch 49 MSE: 9.027418855112046e-05
Epoch 50 MSE: 0.00012016412802040577
Epoch 51 MSE: 0.000134120651637204
Epoch 52 MSE: 0.00010107517300639302
Epoch 53 MSE: 4.7545374400215223e-05
Epoch 54 MSE: 2.6702458853833377e-05
Epoch 55 MSE: 5.261333717498928e-05
Epoch 56 MSE: 8.375279139727354e-05
Epoch 57 MSE: 8.108680776786059e-05
Epoch 58 MSE: 5.661608884111047e-05
Epoch 59 MSE: 4.3734053178923205e-05
Epoch 60 MSE: 4.722478843177669e-05
Epoch 61 MSE: 4.795711356564425e-05
Epoch 62 MSE: 3.8988659071037546e-05
Epoch 63 MSE: 3.362500137882307e-05
Epoch 64 MSE: 4.101977901882492e-05
Epoch 65 MSE: 5.044822319177911e-05
Epoch 66 MSE: 4.68259459012188e-05
Epoch 67 MSE: 3.276687129982747e-05
Epoch 68 MSE: 2.4305238184751943e-05
Epoch 69 MSE: 2.8317141186562367e-05
Epoch 70 MSE: 3.536968506523408e-05
Epoch 71 MSE: 3.544078572303988e-05
Epoch 72 MSE: 3.078533700318076e-05
Epoch 73 MSE: 2.8798343919334002e-05
Epoch 74 MSE: 2.96215384878451e-05
Epoch 75 MSE: 2.827159369189758e-05
Epoch 76 MSE: 2.478153328411281e-05
Epoch 77 MSE: 2.4055567337200046e-05
Epoch 78 MSE: 2.709144609980285e-05
Epoch 79 MSE: 2.9113569326000288e-05
Epoch 80 MSE: 2.6923336918116547e-05
Epoch 81 MSE: 2.3321832486544736e-05
Epoch 82 MSE: 2.2435860955738463e-05
Epoch 83 MSE: 2.3906835849629715e-05
Epoch 84 MSE: 2.4557195501984097e-05
Epoch 85 MSE: 2.367859451624099e-05
Epoch 86 MSE: 2.314449375262484e-05
Epoch 87 MSE: 2.344245331187267e-05
Epoch 88 MSE: 2.3117461751098745e-05

```

Epoch 89 MSE: 2.187075551773887e-05
Epoch 90 MSE: 2.1268244381644763e-05
Epoch 91 MSE: 2.200180824729614e-05
Epoch 92 MSE: 2.2697146050632e-05
Epoch 93 MSE: 2.217919609392993e-05
Epoch 94 MSE: 2.117889562214259e-05
Epoch 95 MSE: 2.0869889340247028e-05
Epoch 96 MSE: 2.1089756046421826e-05
Epoch 97 MSE: 2.1048363123554736e-05
Epoch 98 MSE: 2.0773455617018044e-05
Epoch 99 MSE: 2.0754625438712537e-05
T-time: 144.90676140785217

```

```

=====
Train Score: 0.14 RMSE
=====
Validation Score: 4.20 RMSE
=====

```

```

=====
Time Step = 100 | Hidden States = 2 | Num Layers = 1
=====

```

```

Epoch 0 MSE: 0.07423803955316544
Epoch 1 MSE: 0.06203124672174454
Epoch 2 MSE: 0.052469413727521896
Epoch 3 MSE: 0.0457540825009346
Epoch 4 MSE: 0.04189009219408035
Epoch 5 MSE: 0.040506936609745026
Epoch 6 MSE: 0.0407106950879097
Epoch 7 MSE: 0.041262127459049225
Epoch 8 MSE: 0.041162848472595215
Epoch 9 MSE: 0.040045399218797684
Epoch 10 MSE: 0.03807011991739273
Epoch 11 MSE: 0.03564241901040077
Epoch 12 MSE: 0.033191509544849396
Epoch 13 MSE: 0.031046494841575623
Epoch 14 MSE: 0.02938239835202694
Epoch 15 MSE: 0.028214503079652786
Epoch 16 MSE: 0.02742951363325119
Epoch 17 MSE: 0.02684176340699196
Epoch 18 MSE: 0.02625700831413269
Epoch 19 MSE: 0.025525158271193504
Epoch 20 MSE: 0.024569645524024963
Epoch 21 MSE: 0.023391367867588997
Epoch 22 MSE: 0.022053049877285957
Epoch 23 MSE: 0.02065250650048256
Epoch 24 MSE: 0.01929262839257717

```


Epoch	25	MSE:	0.01805398240685463
Epoch	26	MSE:	0.016975006088614464
Epoch	27	MSE:	0.01604432426393032
Epoch	28	MSE:	0.015208051539957523
Epoch	29	MSE:	0.014390898868441582
Epoch	30	MSE:	0.013524261303246021
Epoch	31	MSE:	0.012570644728839397
Epoch	32	MSE:	0.011534991674125195
Epoch	33	MSE:	0.010459394194185734
Epoch	34	MSE:	0.009404676035046577
Epoch	35	MSE:	0.008426694199442863
Epoch	36	MSE:	0.007556214928627014
Epoch	37	MSE:	0.006789450999349356
Epoch	38	MSE:	0.006092756055295467
Epoch	39	MSE:	0.005419867113232613
Epoch	40	MSE:	0.004734551068395376
Epoch	41	MSE:	0.004028317518532276
Epoch	42	MSE:	0.003324625315144658
Epoch	43	MSE:	0.0026673595421016216
Epoch	44	MSE:	0.0020991861820220947
Epoch	45	MSE:	0.001640652772039175
Epoch	46	MSE:	0.0012813734356313944
Epoch	47	MSE:	0.0009888762142509222
Epoch	48	MSE:	0.0007303132442757487
Epoch	49	MSE:	0.0004932325100526214
Epoch	50	MSE:	0.0002914099604822695
Epoch	51	MSE:	0.00015171340783126652
Epoch	52	MSE:	9.127146768150851e-05
Epoch	53	MSE:	0.0001014421068248339
Epoch	54	MSE:	0.00015079641889315099
Epoch	55	MSE:	0.00020511528418865055
Epoch	56	MSE:	0.00024820936960168183
Epoch	57	MSE:	0.0002865428396034986
Epoch	58	MSE:	0.00033503142185509205
Epoch	59	MSE:	0.0003978427848778665
Epoch	60	MSE:	0.0004613298224285245
Epoch	61	MSE:	0.0005042845150455832
Epoch	62	MSE:	0.0005147713818587363
Epoch	63	MSE:	0.0004979148507118225
Epoch	64	MSE:	0.00046893928083591163
Epoch	65	MSE:	0.00043958373134955764
Epoch	66	MSE:	0.0004105371772311628
Epoch	67	MSE:	0.00037523635546676815
Epoch	68	MSE:	0.0003294380730949342
Epoch	69	MSE:	0.00027689404669217765
Epoch	70	MSE:	0.00022673631610814482
Epoch	71	MSE:	0.00018638174515217543
Epoch	72	MSE:	0.00015689595602452755

```
Epoch 73 MSE: 0.00013425225915852934
Epoch 74 MSE: 0.00011422581155784428
Epoch 75 MSE: 9.608774416847154e-05
Epoch 76 MSE: 8.230422827182338e-05
Epoch 77 MSE: 7.538567297160625e-05
Epoch 78 MSE: 7.517566700698808e-05
Epoch 79 MSE: 7.882052886998281e-05
Epoch 80 MSE: 8.297818567370996e-05
Epoch 81 MSE: 8.603747846791521e-05
Epoch 82 MSE: 8.852807513903826e-05
Epoch 83 MSE: 9.174538718070835e-05
Epoch 84 MSE: 9.608190157450736e-05
Epoch 85 MSE: 0.00010052080324385315
Epoch 86 MSE: 0.00010350743104936555
Epoch 87 MSE: 0.00010421680053696036
Epoch 88 MSE: 0.0001030650528264232
Epoch 89 MSE: 0.0001011444692267105
Epoch 90 MSE: 9.923225297825411e-05
Epoch 91 MSE: 9.728129953145981e-05
Epoch 92 MSE: 9.474386752117425e-05
Epoch 93 MSE: 9.129689715337008e-05
Epoch 94 MSE: 8.725529187358916e-05
Epoch 95 MSE: 8.334159792866558e-05
Epoch 96 MSE: 8.011083264136687e-05
Epoch 97 MSE: 7.759446452837437e-05
Epoch 98 MSE: 7.545122934971005e-05
Epoch 99 MSE: 7.340600859606639e-05
T-time: 56.74695682525635
```

```
=====
Train Score: 0.26 RMSE
=====
Validation Score: 7.49 RMSE
=====
```

```
=====
Time Step = 100 | Hidden States = 2 | Num Layers = 2
=====
```

```
Epoch 0 MSE: 0.04546692967414856
Epoch 1 MSE: 0.039492737501859665
Epoch 2 MSE: 0.03701186925172806
Epoch 3 MSE: 0.037262868136167526
Epoch 4 MSE: 0.03848516196012497
Epoch 5 MSE: 0.03909674286842346
Epoch 6 MSE: 0.03875607252120972
Epoch 7 MSE: 0.03785672411322594
Epoch 8 MSE: 0.03690577298402786
```

Epoch 9 MSE: 0.036265335977077484
Epoch 10 MSE: 0.03607096150517464
Epoch 11 MSE: 0.036232467740774155
Epoch 12 MSE: 0.03651275485754013
Epoch 13 MSE: 0.03666657209396362
Epoch 14 MSE: 0.03656286001205444
Epoch 15 MSE: 0.0362187959253788
Epoch 16 MSE: 0.03575211390852928
Epoch 17 MSE: 0.035303615033626556
Epoch 18 MSE: 0.03497019037604332
Epoch 19 MSE: 0.03476761654019356
Epoch 20 MSE: 0.034632358700037
Epoch 21 MSE: 0.03446051850914955
Epoch 22 MSE: 0.03416404500603676
Epoch 23 MSE: 0.033712781965732574
Epoch 24 MSE: 0.03314195200800896
Epoch 25 MSE: 0.0325264148414135
Epoch 26 MSE: 0.03193730115890503
Epoch 27 MSE: 0.031399961560964584
Epoch 28 MSE: 0.03087461367249489
Epoch 29 MSE: 0.03027934394776821
Epoch 30 MSE: 0.029548119753599167
Epoch 31 MSE: 0.028676461428403854
Epoch 32 MSE: 0.027718178927898407
Epoch 33 MSE: 0.026741987094283104
Epoch 34 MSE: 0.025780363008379936
Epoch 35 MSE: 0.024804767221212387
Epoch 36 MSE: 0.023749710991978645
Epoch 37 MSE: 0.022572260349988937
Epoch 38 MSE: 0.021292176097631454
Epoch 39 MSE: 0.019971059635281563
Epoch 40 MSE: 0.018647434189915657
Epoch 41 MSE: 0.017296766862273216
Epoch 42 MSE: 0.01587512530386448
Epoch 43 MSE: 0.014394804835319519
Epoch 44 MSE: 0.012926464900374413
Epoch 45 MSE: 0.011520176194608212
Epoch 46 MSE: 0.01014833152294159
Epoch 47 MSE: 0.008774110116064548
Epoch 48 MSE: 0.007447860203683376
Epoch 49 MSE: 0.006262198090553284
Epoch 50 MSE: 0.005233408883213997
Epoch 51 MSE: 0.004330867901444435
Epoch 52 MSE: 0.0036014374345541
Epoch 53 MSE: 0.0030914756935089827
Epoch 54 MSE: 0.0027346331626176834
Epoch 55 MSE: 0.0024928415659815073
Epoch 56 MSE: 0.0024006287567317486

```

Epoch 57 MSE: 0.002391925547271967
Epoch 58 MSE: 0.0023851708974689245
Epoch 59 MSE: 0.0023738685995340347
Epoch 60 MSE: 0.0023164749145507812
Epoch 61 MSE: 0.0021702104713767767
Epoch 62 MSE: 0.001958096632733941
Epoch 63 MSE: 0.0017094245413318276
Epoch 64 MSE: 0.0014404141111299396
Epoch 65 MSE: 0.0011885068379342556
Epoch 66 MSE: 0.0009959802264347672
Epoch 67 MSE: 0.0008758686017245054
Epoch 68 MSE: 0.0008225042838603258
Epoch 69 MSE: 0.0008290021796710789
Epoch 70 MSE: 0.0008760112687014043
Epoch 71 MSE: 0.0009308027802035213
Epoch 72 MSE: 0.0009687095298431814
Epoch 73 MSE: 0.0009778348030522466
Epoch 74 MSE: 0.0009502273751422763
Epoch 75 MSE: 0.0008872014586813748
Epoch 76 MSE: 0.0008047525770962238
Epoch 77 MSE: 0.0007217270904220641
Epoch 78 MSE: 0.0006502973265014589
Epoch 79 MSE: 0.0005998355918563902
Epoch 80 MSE: 0.0005758393090218306
Epoch 81 MSE: 0.0005733300349675119
Epoch 82 MSE: 0.0005821590893901885
Epoch 83 MSE: 0.000594444340094924
Epoch 84 MSE: 0.000601722567807883
Epoch 85 MSE: 0.0005966474418528378
Epoch 86 MSE: 0.0005789684946648777
Epoch 87 MSE: 0.0005519011756405234
Epoch 88 MSE: 0.0005189916118979454
Epoch 89 MSE: 0.0004864619404543191
Epoch 90 MSE: 0.00045988193596713245
Epoch 91 MSE: 0.000440801348304376
Epoch 92 MSE: 0.00042945839231833816
Epoch 93 MSE: 0.0004246684839017689
Epoch 94 MSE: 0.00042259303154423833
Epoch 95 MSE: 0.0004198986280243844
Epoch 96 MSE: 0.00041479148785583675
Epoch 97 MSE: 0.0004057793412357569
Epoch 98 MSE: 0.0003930859384126961
Epoch 99 MSE: 0.0003785613225772977
T-time: 77.59450316429138

```

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=====
Train Score: 0.58 RMSE
=====

```

Validation Score: 14.09 RMSE

=====

=====

Time Step = 100 | Hidden States = 4 | Num Layers = 1

=====

Epoch	0	MSE:	0.10220576822757721
Epoch	1	MSE:	0.07853984087705612
Epoch	2	MSE:	0.059243734925985336
Epoch	3	MSE:	0.04412482678890228
Epoch	4	MSE:	0.03293940797448158
Epoch	5	MSE:	0.025347158312797546
Epoch	6	MSE:	0.020899901166558266
Epoch	7	MSE:	0.019051596522331238
Epoch	8	MSE:	0.01916619762778282
Epoch	9	MSE:	0.02053479477763176
Epoch	10	MSE:	0.022429851815104485
Epoch	11	MSE:	0.02420106716454029
Epoch	12	MSE:	0.025373516604304314
Epoch	13	MSE:	0.025697452947497368
Epoch	14	MSE:	0.025134656578302383
Epoch	15	MSE:	0.02380424551665783
Epoch	16	MSE:	0.02191835455596447
Epoch	17	MSE:	0.01972578652203083
Epoch	18	MSE:	0.017469344660639763
Epoch	19	MSE:	0.015356210060417652
Epoch	20	MSE:	0.013539176434278488
Epoch	21	MSE:	0.012106914073228836
Epoch	22	MSE:	0.01108232419937849
Epoch	23	MSE:	0.010428481735289097
Epoch	24	MSE:	0.010061383247375488
Epoch	25	MSE:	0.00986784603446722
Epoch	26	MSE:	0.009725969284772873
Epoch	27	MSE:	0.009525023400783539
Epoch	28	MSE:	0.00918186642229557
Epoch	29	MSE:	0.008651645854115486
Epoch	30	MSE:	0.007931661792099476
Epoch	31	MSE:	0.007058367598801851
Epoch	32	MSE:	0.00609850836917758
Epoch	33	MSE:	0.005135832820087671
Epoch	34	MSE:	0.004255205858498812
Epoch	35	MSE:	0.003526163287460804
Epoch	36	MSE:	0.002988358959555626
Epoch	37	MSE:	0.0026421102229505777
Epoch	38	MSE:	0.002447565319016576
Epoch	39	MSE:	0.00233506690710783
Epoch	40	MSE:	0.0022260015830397606

Epoch 41 MSE: 0.002058287151157856
Epoch 42 MSE: 0.0018067972268909216
Epoch 43 MSE: 0.0014899043599143624
Epoch 44 MSE: 0.0011593729723244905
Epoch 45 MSE: 0.0008783051744103432
Epoch 46 MSE: 0.0006964997737668455
Epoch 47 MSE: 0.0006327287410385907
Epoch 48 MSE: 0.0006699720397591591
Epoch 49 MSE: 0.0007642891141586006
Epoch 50 MSE: 0.0008627736242488027
Epoch 51 MSE: 0.0009229031857103109
Epoch 52 MSE: 0.0009257762576453388
Epoch 53 MSE: 0.0008789279963821173
Epoch 54 MSE: 0.0008089102921076119
Epoch 55 MSE: 0.0007475875318050385
Epoch 56 MSE: 0.0007180253160186112
Epoch 57 MSE: 0.0007255761884152889
Epoch 58 MSE: 0.0007574784685857594
Epoch 59 MSE: 0.0007905612583272159
Epoch 60 MSE: 0.0008028799784369767
Epoch 61 MSE: 0.0007833780255168676
Epoch 62 MSE: 0.0007352196262218058
Epoch 63 MSE: 0.0006721830577589571
Epoch 64 MSE: 0.0006110584363341331
Epoch 65 MSE: 0.0005642797332257032
Epoch 66 MSE: 0.00053595524514094
Epoch 67 MSE: 0.00052222719155252
Epoch 68 MSE: 0.0005147704505361617
Epoch 69 MSE: 0.0005053511704318225
Epoch 70 MSE: 0.0004892313736490905
Epoch 71 MSE: 0.00046643923269584775
Epoch 72 MSE: 0.000440796633483842
Epoch 73 MSE: 0.000417589966673404
Epoch 74 MSE: 0.00040106853703036904
Epoch 75 MSE: 0.00039280415512621403
Epoch 76 MSE: 0.0003914093831554055
Epoch 77 MSE: 0.0003935022104997188
Epoch 78 MSE: 0.00039531258516944945
Epoch 79 MSE: 0.00039417247171513736
Epoch 80 MSE: 0.0003893002576660365
Epoch 81 MSE: 0.00038168136961758137
Epoch 82 MSE: 0.0003732599434442818
Epoch 83 MSE: 0.0003659017675090581
Epoch 84 MSE: 0.00036059843841940165
Epoch 85 MSE: 0.000357194512616843
Epoch 86 MSE: 0.0003546536900103092
Epoch 87 MSE: 0.0003516550059430301
Epoch 88 MSE: 0.00034721099655143917

```

Epoch 89 MSE: 0.000341048784321174
Epoch 90 MSE: 0.00033362957765348256
Epoch 91 MSE: 0.0003258560609538108
Epoch 92 MSE: 0.00031864148331806064
Epoch 93 MSE: 0.0003125403309240937
Epoch 94 MSE: 0.00030758912907913327
Epoch 95 MSE: 0.0003033971297554672
Epoch 96 MSE: 0.0002994030073750764
Epoch 97 MSE: 0.00029516342328861356
Epoch 98 MSE: 0.0002905353903770447
Epoch 99 MSE: 0.00028568870038725436
T-time: 40.47112464904785

```

```
=====
```

```
Train Score: 0.50 RMSE
```

```
=====
```

```
Validation Score: 12.05 RMSE
```

```
=====
```

```
=====
```

```
Time Step = 100 | Hidden States = 4 | Num Layers = 2
```

```
=====
```

```

Epoch 0 MSE: 0.1444215029478073
Epoch 1 MSE: 0.11018645018339157
Epoch 2 MSE: 0.08276725560426712
Epoch 3 MSE: 0.06244712322950363
Epoch 4 MSE: 0.04919372871518135
Epoch 5 MSE: 0.04265103116631508
Epoch 6 MSE: 0.04183473065495491
Epoch 7 MSE: 0.0447232723236084
Epoch 8 MSE: 0.04855465143918991
Epoch 9 MSE: 0.05105692520737648
Epoch 10 MSE: 0.05128556117415428
Epoch 11 MSE: 0.04943313077092171
Epoch 12 MSE: 0.04625749588012695
Epoch 13 MSE: 0.042622923851013184
Epoch 14 MSE: 0.03924108296632767
Epoch 15 MSE: 0.03656504675745964
Epoch 16 MSE: 0.034782178699970245
Epoch 17 MSE: 0.03386238217353821
Epoch 18 MSE: 0.03362828493118286
Epoch 19 MSE: 0.03382584825158119
Epoch 20 MSE: 0.03418457880616188
Epoch 21 MSE: 0.0344633013010025
Epoch 22 MSE: 0.03448079153895378
Epoch 23 MSE: 0.03413241356611252
Epoch 24 MSE: 0.033394403755664825

```

Epoch	25	MSE:	0.032317277044057846
Epoch	26	MSE:	0.03101016767323017
Epoch	27	MSE:	0.02961764857172966
Epoch	28	MSE:	0.02829066663980484
Epoch	29	MSE:	0.027154089882969856
Epoch	30	MSE:	0.026275523006916046
Epoch	31	MSE:	0.025643348693847656
Epoch	32	MSE:	0.02516402117908001
Epoch	33	MSE:	0.024686094373464584
Epoch	34	MSE:	0.024048419669270515
Epoch	35	MSE:	0.023136435076594353
Epoch	36	MSE:	0.021923422813415527
Epoch	37	MSE:	0.020479852333664894
Epoch	38	MSE:	0.018947433680295944
Epoch	39	MSE:	0.01748671755194664
Epoch	40	MSE:	0.01621326245367527
Epoch	41	MSE:	0.01514194905757904
Epoch	42	MSE:	0.014165359549224377
Epoch	43	MSE:	0.01309503149241209
Epoch	44	MSE:	0.01177107822149992
Epoch	45	MSE:	0.01018507406115532
Epoch	46	MSE:	0.008516045287251472
Epoch	47	MSE:	0.007023153826594353
Epoch	48	MSE:	0.005849786102771759
Epoch	49	MSE:	0.004897790495306253
Epoch	50	MSE:	0.003932515624910593
Epoch	51	MSE:	0.0028669352177530527
Epoch	52	MSE:	0.0019222976407036185
Epoch	53	MSE:	0.0014250932727009058
Epoch	54	MSE:	0.0013517956249415874
Epoch	55	MSE:	0.0012652021832764149
Epoch	56	MSE:	0.0010329284705221653
Epoch	57	MSE:	0.0010661482810974121
Epoch	58	MSE:	0.0014895591884851456
Epoch	59	MSE:	0.0018221276113763452
Epoch	60	MSE:	0.001871944172307849
Epoch	61	MSE:	0.0020059142261743546
Epoch	62	MSE:	0.0022587846033275127
Epoch	63	MSE:	0.002244588453322649
Epoch	64	MSE:	0.0020266538485884666
Epoch	65	MSE:	0.0019052538555115461
Epoch	66	MSE:	0.0017994402442127466
Epoch	67	MSE:	0.0015432026702910662
Epoch	68	MSE:	0.0012647812254726887
Epoch	69	MSE:	0.001112647820264101
Epoch	70	MSE:	0.0010124570690095425
Epoch	71	MSE:	0.000872080447152257
Epoch	72	MSE:	0.0007491898140870035

Epoch 73 MSE: 0.0007145026465877891
Epoch 74 MSE: 0.0007316105184145272
Epoch 75 MSE: 0.0007351094391196966
Epoch 76 MSE: 0.0007271296926774085
Epoch 77 MSE: 0.0007455088198184967
Epoch 78 MSE: 0.0007888891850598156
Epoch 79 MSE: 0.0008192001841962337
Epoch 80 MSE: 0.0008194715483114123
Epoch 81 MSE: 0.0008103110012598336
Epoch 82 MSE: 0.0008098486578091979
Epoch 83 MSE: 0.000806908356025815
Epoch 84 MSE: 0.000783643452450633
Epoch 85 MSE: 0.0007451748824678361
Epoch 86 MSE: 0.0007108498830348253
Epoch 87 MSE: 0.000685626408085227
Epoch 88 MSE: 0.0006576431915163994
Epoch 89 MSE: 0.0006223925738595426
Epoch 90 MSE: 0.0005915513611398637
Epoch 91 MSE: 0.0005736767197959125
Epoch 92 MSE: 0.0005617919377982616
Epoch 93 MSE: 0.0005477476515807211
Epoch 94 MSE: 0.0005358822527341545
Epoch 95 MSE: 0.0005327108083292842
Epoch 96 MSE: 0.0005336332251317799
Epoch 97 MSE: 0.0005308142863214016
Epoch 98 MSE: 0.0005258049350231886
Epoch 99 MSE: 0.000523637980222702
T-time: 85.3030617237091

=====

Train Score: 0.68 RMSE

=====

Validation Score: 13.13 RMSE

=====

=====

Time Step = 100 | Hidden States = 8 | Num Layers = 1

=====

Epoch 0 MSE: 0.21307465434074402
Epoch 1 MSE: 0.16439317166805267
Epoch 2 MSE: 0.12413185834884644
Epoch 3 MSE: 0.09195061028003693
Epoch 4 MSE: 0.06756473332643509
Epoch 5 MSE: 0.05056929588317871
Epoch 6 MSE: 0.04040263965725899
Epoch 7 MSE: 0.03625325858592987
Epoch 8 MSE: 0.03686176985502243

Epoch 9 MSE: 0.0403037890791893
Epoch 10 MSE: 0.04423845559358597
Epoch 11 MSE: 0.0468221940100193
Epoch 12 MSE: 0.04727797582745552
Epoch 13 MSE: 0.04571162909269333
Epoch 14 MSE: 0.04268897697329521
Epoch 15 MSE: 0.03889985382556915
Epoch 16 MSE: 0.03496181592345238
Epoch 17 MSE: 0.03133165091276169
Epoch 18 MSE: 0.028285760432481766
Epoch 19 MSE: 0.025939077138900757
Epoch 20 MSE: 0.024281766265630722
Epoch 21 MSE: 0.023220090195536613
Epoch 22 MSE: 0.02261369116604328
Epoch 23 MSE: 0.022305656224489212
Epoch 24 MSE: 0.022144578397274017
Epoch 25 MSE: 0.021999189630150795
Epoch 26 MSE: 0.021766914054751396
Epoch 27 MSE: 0.021377556025981903
Epoch 28 MSE: 0.02079332433640957
Epoch 29 MSE: 0.020006267353892326
Epoch 30 MSE: 0.019033759832382202
Epoch 31 MSE: 0.01791279949247837
Epoch 32 MSE: 0.01669355109333992
Epoch 33 MSE: 0.015432585962116718
Epoch 34 MSE: 0.014186141081154346
Epoch 35 MSE: 0.01300378143787384
Epoch 36 MSE: 0.011922873556613922
Epoch 37 MSE: 0.01096434984356165
Epoch 38 MSE: 0.010130415670573711
Epoch 39 MSE: 0.009404776617884636
Epoch 40 MSE: 0.008755873888731003
Epoch 41 MSE: 0.008143097162246704
Epoch 42 MSE: 0.007525244262069464
Epoch 43 MSE: 0.006869649514555931
Epoch 44 MSE: 0.00615982711315155
Epoch 45 MSE: 0.005399538669735193
Epoch 46 MSE: 0.004611989948898554
Epoch 47 MSE: 0.003834160277619958
Epoch 48 MSE: 0.003107746597379446
Epoch 49 MSE: 0.002469075843691826
Epoch 50 MSE: 0.0019406956853345037
Epoch 51 MSE: 0.0015268274582922459
Epoch 52 MSE: 0.001213868847116828
Epoch 53 MSE: 0.000975769420620054
Epoch 54 MSE: 0.0007827263325452805
Epoch 55 MSE: 0.0006106162909418344
Epoch 56 MSE: 0.00044818909373134375

```

Epoch 57 MSE: 0.00029955184436403215
Epoch 58 MSE: 0.00018080505833495408
Epoch 59 MSE: 0.00011163775343447924
Epoch 60 MSE: 0.00010474259033799171
Epoch 61 MSE: 0.00015741791867185384
Epoch 62 MSE: 0.00024966997443698347
Epoch 63 MSE: 0.0003506930952426046
Epoch 64 MSE: 0.0004311867814976722
Epoch 65 MSE: 0.0004750486696138978
Epoch 66 MSE: 0.0004838556924369186
Epoch 67 MSE: 0.00047201261622831225
Epoch 68 MSE: 0.0004563276015687734
Epoch 69 MSE: 0.0004466180398594588
Epoch 70 MSE: 0.0004422167257871479
Epoch 71 MSE: 0.0004349572991486639
Epoch 72 MSE: 0.00041559801320545375
Epoch 73 MSE: 0.00037958758184686303
Epoch 74 MSE: 0.0003294071357231587
Epoch 75 MSE: 0.0002730463456828147
Epoch 76 MSE: 0.00022010145767126232
Epoch 77 MSE: 0.0001777557481545955
Epoch 78 MSE: 0.00014849184663034976
Epoch 79 MSE: 0.00013024781947024167
Epoch 80 MSE: 0.00011847461428260431
Epoch 81 MSE: 0.00010878115426748991
Epoch 82 MSE: 9.88347819657065e-05
Epoch 83 MSE: 8.881568646756932e-05
Epoch 84 MSE: 8.055246144067496e-05
Epoch 85 MSE: 7.605756400153041e-05
Epoch 86 MSE: 7.62856361689046e-05
Epoch 87 MSE: 8.063781569944695e-05
Epoch 88 MSE: 8.727635577088222e-05
Epoch 89 MSE: 9.394437802257016e-05
Epoch 90 MSE: 9.883580059977248e-05
Epoch 91 MSE: 0.00010114053293364123
Epoch 92 MSE: 0.00010109751019626856
Epoch 93 MSE: 9.962640615412965e-05
Epoch 94 MSE: 9.776585648069158e-05
Epoch 95 MSE: 9.618794138077646e-05
Epoch 96 MSE: 9.498312283540145e-05
Epoch 97 MSE: 9.376114030601457e-05
Epoch 98 MSE: 9.196951577905566e-05
Epoch 99 MSE: 8.924550638766959e-05
T-time: 51.17449331283569

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=====
Train Score: 0.28 RMSE
=====

```

Validation Score: 6.78 RMSE

=====

=====

Time Step = 100 | Hidden States = 8 | Num Layers = 2

=====

Epoch	0	MSE:	0.03707471862435341
Epoch	1	MSE:	0.03339564427733421
Epoch	2	MSE:	0.03382086753845215
Epoch	3	MSE:	0.029311953112483025
Epoch	4	MSE:	0.026628896594047546
Epoch	5	MSE:	0.026382839307188988
Epoch	6	MSE:	0.02467113919556141
Epoch	7	MSE:	0.020772360265254974
Epoch	8	MSE:	0.017268899828195572
Epoch	9	MSE:	0.01546290423721075
Epoch	10	MSE:	0.013103884644806385
Epoch	11	MSE:	0.008965568616986275
Epoch	12	MSE:	0.0055631957948207855
Epoch	13	MSE:	0.004204455763101578
Epoch	14	MSE:	0.001970494631677866
Epoch	15	MSE:	0.00017035131168086082
Epoch	16	MSE:	0.001989265438169241
Epoch	17	MSE:	0.002198874717578292
Epoch	18	MSE:	0.003577090334147215
Epoch	19	MSE:	0.004798573441803455
Epoch	20	MSE:	0.0034950003027915955
Epoch	21	MSE:	0.0032668248750269413
Epoch	22	MSE:	0.0021388300228863955
Epoch	23	MSE:	0.0007597546791657805
Epoch	24	MSE:	0.0005750337149947882
Epoch	25	MSE:	0.00047475830069743097
Epoch	26	MSE:	0.00026603866717778146
Epoch	27	MSE:	0.0005514256190508604
Epoch	28	MSE:	0.00102122756652534
Epoch	29	MSE:	0.001158423605374992
Epoch	30	MSE:	0.0011383543023839593
Epoch	31	MSE:	0.0012428631307557225
Epoch	32	MSE:	0.001294125453568995
Epoch	33	MSE:	0.0010787484934553504
Epoch	34	MSE:	0.0007814308046363294
Epoch	35	MSE:	0.0006264981348067522
Epoch	36	MSE:	0.0004919327911920846
Epoch	37	MSE:	0.000257274106843397
Epoch	38	MSE:	0.00012254850298631936
Epoch	39	MSE:	0.0001810167741496116
Epoch	40	MSE:	0.0002226835349574685

Epoch	41	MSE:	0.00023431015142705292
Epoch	42	MSE:	0.0003563696227502078
Epoch	43	MSE:	0.00044023056398145854
Epoch	44	MSE:	0.00039304152596741915
Epoch	45	MSE:	0.00036826246650889516
Epoch	46	MSE:	0.00033599662128835917
Epoch	47	MSE:	0.00022387749049812555
Epoch	48	MSE:	0.00015149140381254256
Epoch	49	MSE:	0.0001400683104293421
Epoch	50	MSE:	0.0001097247441066429
Epoch	51	MSE:	0.00010004715295508504
Epoch	52	MSE:	0.0001414777507307008
Epoch	53	MSE:	0.0001680078567005694
Epoch	54	MSE:	0.000169643375556916
Epoch	55	MSE:	0.00018527763313613832
Epoch	56	MSE:	0.00019057428289670497
Epoch	57	MSE:	0.00016295266686938703
Epoch	58	MSE:	0.00013896753080189228
Epoch	59	MSE:	0.00012634349695872515
Epoch	60	MSE:	0.00010164775449084118
Epoch	61	MSE:	8.449011511402205e-05
Epoch	62	MSE:	8.968573092715815e-05
Epoch	63	MSE:	9.202333603752777e-05
Epoch	64	MSE:	9.384521399624646e-05
Epoch	65	MSE:	0.00010718196426751092
Epoch	66	MSE:	0.0001113109610741958
Epoch	67	MSE:	0.0001056872060871683
Epoch	68	MSE:	0.00010432756971567869
Epoch	69	MSE:	9.646008402341977e-05
Epoch	70	MSE:	8.415548654738814e-05
Epoch	71	MSE:	8.013949991436675e-05
Epoch	72	MSE:	7.67805686336942e-05
Epoch	73	MSE:	7.330214430112392e-05
Epoch	74	MSE:	7.672999345231801e-05
Epoch	75	MSE:	7.954927423270419e-05
Epoch	76	MSE:	7.931651634862646e-05
Epoch	77	MSE:	8.108190377242863e-05
Epoch	78	MSE:	8.023018745006993e-05
Epoch	79	MSE:	7.59852264309302e-05
Epoch	80	MSE:	7.36021320335567e-05
Epoch	81	MSE:	7.067799742799252e-05
Epoch	82	MSE:	6.712538743158802e-05
Epoch	83	MSE:	6.666338595096022e-05
Epoch	84	MSE:	6.651911826338619e-05
Epoch	85	MSE:	6.60781588521786e-05
Epoch	86	MSE:	6.720135570503771e-05
Epoch	87	MSE:	6.711105379508808e-05
Epoch	88	MSE:	6.597684841835871e-05

Epoch 89 MSE: 6.532115367008373e-05
Epoch 90 MSE: 6.350124021992087e-05
Epoch 91 MSE: 6.168305844767019e-05
Epoch 92 MSE: 6.082875916035846e-05
Epoch 93 MSE: 5.968105688225478e-05
Epoch 94 MSE: 5.9179612435400486e-05
Epoch 95 MSE: 5.924106153543107e-05
Epoch 96 MSE: 5.877306466572918e-05
Epoch 97 MSE: 5.8503224863670766e-05
Epoch 98 MSE: 5.8056681154994294e-05
Epoch 99 MSE: 5.703550050384365e-05
T-time: 99.33873701095581

=====
Train Score: 0.23 RMSE
=====
Validation Score: 6.30 RMSE
=====

=====
Time Step = 100 | Hidden States = 16 | Num Layers = 1
=====

Epoch 0 MSE: 0.06706604361534119
Epoch 1 MSE: 0.04436690732836723
Epoch 2 MSE: 0.03370099887251854
Epoch 3 MSE: 0.03338708356022835
Epoch 4 MSE: 0.03549585118889809
Epoch 5 MSE: 0.03388630598783493
Epoch 6 MSE: 0.029704220592975616
Epoch 7 MSE: 0.025595663115382195
Epoch 8 MSE: 0.02292419783771038
Epoch 9 MSE: 0.021736405789852142
Epoch 10 MSE: 0.02131044492125511
Epoch 11 MSE: 0.02072521485388279
Epoch 12 MSE: 0.019384324550628662
Epoch 13 MSE: 0.017254222184419632
Epoch 14 MSE: 0.014734073542058468
Epoch 15 MSE: 0.012380959466099739
Epoch 16 MSE: 0.010623198933899403
Epoch 17 MSE: 0.009497130289673805
Epoch 18 MSE: 0.008553418330848217
Epoch 19 MSE: 0.007190728560090065
Epoch 20 MSE: 0.005215237848460674
Epoch 21 MSE: 0.003054378554224968
Epoch 22 MSE: 0.001491608563810587
Epoch 23 MSE: 0.0010530737927183509
Epoch 24 MSE: 0.0012996805598959327

Epoch	25	MSE:	0.0012142715277150273
Epoch	26	MSE:	0.000877538463100791
Epoch	27	MSE:	0.001353441271930933
Epoch	28	MSE:	0.0025009859818965197
Epoch	29	MSE:	0.002752043539658189
Epoch	30	MSE:	0.00196783896535635
Epoch	31	MSE:	0.0012694193283095956
Epoch	32	MSE:	0.0010614170460030437
Epoch	33	MSE:	0.0009098565205931664
Epoch	34	MSE:	0.0005585725884884596
Epoch	35	MSE:	0.00019879775936715305
Epoch	36	MSE:	6.967384979361668e-05
Epoch	37	MSE:	0.00018242886289954185
Epoch	38	MSE:	0.0003692642494570464
Epoch	39	MSE:	0.00047615604125894606
Epoch	40	MSE:	0.0004777273570653051
Epoch	41	MSE:	0.0004449227126315236
Epoch	42	MSE:	0.0004466602113097906
Epoch	43	MSE:	0.0004872452700510621
Epoch	44	MSE:	0.0005169539363123477
Epoch	45	MSE:	0.00048727335524745286
Epoch	46	MSE:	0.0003959729219786823
Epoch	47	MSE:	0.00028640570235438645
Epoch	48	MSE:	0.0002076614327961579
Epoch	49	MSE:	0.00017369668057654053
Epoch	50	MSE:	0.0001584828714840114
Epoch	51	MSE:	0.00013017824676353484
Epoch	52	MSE:	8.755193266551942e-05
Epoch	53	MSE:	5.917192902415991e-05
Epoch	54	MSE:	6.800428673159331e-05
Epoch	55	MSE:	0.00010349390504416078
Epoch	56	MSE:	0.00013315663090907037
Epoch	57	MSE:	0.00013798117288388312
Epoch	58	MSE:	0.00012853436055593193
Epoch	59	MSE:	0.00012526832870207727
Epoch	60	MSE:	0.00013122511154506356
Epoch	61	MSE:	0.00013115291949361563
Epoch	62	MSE:	0.00011416633060434833
Epoch	63	MSE:	8.813440217636526e-05
Epoch	64	MSE:	6.924971239641309e-05
Epoch	65	MSE:	6.358843529596925e-05
Epoch	66	MSE:	6.368599861161783e-05
Epoch	67	MSE:	6.0667422076221555e-05
Epoch	68	MSE:	5.4665451898472384e-05
Epoch	69	MSE:	5.2287225116742775e-05
Epoch	70	MSE:	5.694434730685316e-05
Epoch	71	MSE:	6.455151742557064e-05
Epoch	72	MSE:	6.857593689346686e-05

Epoch 73 MSE: 6.713128095725551e-05
Epoch 74 MSE: 6.37619523331523e-05
Epoch 75 MSE: 6.217361806193367e-05
Epoch 76 MSE: 6.198904156917706e-05
Epoch 77 MSE: 6.018760905135423e-05
Epoch 78 MSE: 5.5544231145177037e-05
Epoch 79 MSE: 5.0296879635425285e-05
Epoch 80 MSE: 4.737967537948862e-05
Epoch 81 MSE: 4.7098674258450046e-05
Epoch 82 MSE: 4.734839603770524e-05
Epoch 83 MSE: 4.662638093577698e-05
Epoch 84 MSE: 4.5698190660914406e-05
Epoch 85 MSE: 4.602025364874862e-05
Epoch 86 MSE: 4.746290505863726e-05
Epoch 87 MSE: 4.8443380364915356e-05
Epoch 88 MSE: 4.798573718289845e-05
Epoch 89 MSE: 4.675654417951591e-05
Epoch 90 MSE: 4.58893773611635e-05
Epoch 91 MSE: 4.5484954171111553e-05
Epoch 92 MSE: 4.479126801015809e-05
Epoch 93 MSE: 4.350845483713783e-05
Epoch 94 MSE: 4.225626980769448e-05
Epoch 95 MSE: 4.169773092144169e-05
Epoch 96 MSE: 4.170795000391081e-05
Epoch 97 MSE: 4.168456143816002e-05
Epoch 98 MSE: 4.1391278500668705e-05
Epoch 99 MSE: 4.113239629077725e-05
T-time: 70.78889799118042

=====
Train Score: 0.19 RMSE
=====
Validation Score: 4.46 RMSE
=====

=====
Time Step = 100 | Hidden States = 16 | Num Layers = 2
=====

Epoch 0 MSE: 0.12408258020877838
Epoch 1 MSE: 0.06453608721494675
Epoch 2 MSE: 0.03515148162841797
Epoch 3 MSE: 0.034154269844293594
Epoch 4 MSE: 0.04511204734444618
Epoch 5 MSE: 0.04360612854361534
Epoch 6 MSE: 0.03564880043268204
Epoch 7 MSE: 0.029487252235412598
Epoch 8 MSE: 0.02728523686528206

Epoch 9 MSE: 0.027724647894501686
Epoch 10 MSE: 0.028681151568889618
Epoch 11 MSE: 0.028585800901055336
Epoch 12 MSE: 0.026901012286543846
Epoch 13 MSE: 0.02389497123658657
Epoch 14 MSE: 0.020236847922205925
Epoch 15 MSE: 0.01670481264591217
Epoch 16 MSE: 0.01395954005420208
Epoch 17 MSE: 0.012199055403470993
Epoch 18 MSE: 0.010709742084145546
Epoch 19 MSE: 0.008159126155078411
Epoch 20 MSE: 0.004191787447780371
Epoch 21 MSE: 0.000692032219376415
Epoch 22 MSE: 0.0009982777992263436
Epoch 23 MSE: 0.004843182861804962
Epoch 24 MSE: 0.0056277173571288586
Epoch 25 MSE: 0.003672871505841613
Epoch 26 MSE: 0.0026158876717090607
Epoch 27 MSE: 0.0023620196152478456
Epoch 28 MSE: 0.001544103492051363
Epoch 29 MSE: 0.0006061323801986873
Epoch 30 MSE: 0.0003800494596362114
Epoch 31 MSE: 0.0008715828880667686
Epoch 32 MSE: 0.0015608648536726832
Epoch 33 MSE: 0.001973407808691263
Epoch 34 MSE: 0.0019337314879521728
Epoch 35 MSE: 0.0015515782870352268
Epoch 36 MSE: 0.0010862150229513645
Epoch 37 MSE: 0.0007720896392129362
Epoch 38 MSE: 0.0006712692556902766
Epoch 39 MSE: 0.0006482896860688925
Epoch 40 MSE: 0.0005273931310512125
Epoch 41 MSE: 0.00030473674996756017
Epoch 42 MSE: 0.0001631538907531649
Epoch 43 MSE: 0.00025060708867385983
Epoch 44 MSE: 0.0004900599597021937
Epoch 45 MSE: 0.000653125171083957
Epoch 46 MSE: 0.0006010524230077863
Epoch 47 MSE: 0.0004058657796122134
Epoch 48 MSE: 0.00023931267787702382
Epoch 49 MSE: 0.00018908140191342682
Epoch 50 MSE: 0.00020533171482384205
Epoch 51 MSE: 0.00020141387358307838
Epoch 52 MSE: 0.00016055458399932832
Epoch 53 MSE: 0.0001315039990004152
Epoch 54 MSE: 0.00015318852092605084
Epoch 55 MSE: 0.00020971804042346776
Epoch 56 MSE: 0.0002506873570382595

Epoch 57 MSE: 0.00023992203932721168
Epoch 58 MSE: 0.00018434414232615381
Epoch 59 MSE: 0.00012327289732638747
Epoch 60 MSE: 9.210797725245357e-05
Epoch 61 MSE: 9.352048800792545e-05
Epoch 62 MSE: 0.00010255491361021996
Epoch 63 MSE: 9.870973735814914e-05
Epoch 64 MSE: 8.763580990489572e-05
Epoch 65 MSE: 8.799202623777092e-05
Epoch 66 MSE: 0.00010355298581998795
Epoch 67 MSE: 0.00011711034312611446
Epoch 68 MSE: 0.000111307468614541
Epoch 69 MSE: 8.840915688779205e-05
Epoch 70 MSE: 6.641383515670896e-05
Epoch 71 MSE: 5.906332080485299e-05
Epoch 72 MSE: 6.377045065164566e-05
Epoch 73 MSE: 6.879927241243422e-05
Epoch 74 MSE: 6.791523628635332e-05
Epoch 75 MSE: 6.486866186605766e-05
Epoch 76 MSE: 6.538009620271623e-05
Epoch 77 MSE: 6.887183553772047e-05
Epoch 78 MSE: 6.956209836062044e-05
Epoch 79 MSE: 6.394551746780053e-05
Epoch 80 MSE: 5.5134310969151556e-05
Epoch 81 MSE: 4.940983490087092e-05
Epoch 82 MSE: 4.948896457790397e-05
Epoch 83 MSE: 5.234123455011286e-05
Epoch 84 MSE: 5.3549647418549284e-05
Epoch 85 MSE: 5.2294381021056324e-05
Epoch 86 MSE: 5.09826531924773e-05
Epoch 87 MSE: 5.1067057938780636e-05
Epoch 88 MSE: 5.1124010497005656e-05
Epoch 89 MSE: 4.9258695071330294e-05
Epoch 90 MSE: 4.5962584408698604e-05
Epoch 91 MSE: 4.359228478278965e-05
Epoch 92 MSE: 4.349750452092849e-05
Epoch 93 MSE: 4.463021832634695e-05
Epoch 94 MSE: 4.51103514933493e-05
Epoch 95 MSE: 4.440019984031096e-05
Epoch 96 MSE: 4.341286330600269e-05
Epoch 97 MSE: 4.290915603633039e-05
Epoch 98 MSE: 4.255413296050392e-05
Epoch 99 MSE: 4.16774237237405e-05
T-time: 164.85564827919006

=====
Train Score: 0.19 RMSE
=====

Validation Score: 7.29 RMSE

=====

=====

Time Step = 100 | Hidden States = 32 | Num Layers = 1

=====

Epoch	0	MSE:	0.043193817138671875
Epoch	1	MSE:	0.0328713022172451
Epoch	2	MSE:	0.031449638307094574
Epoch	3	MSE:	0.0252162404358387
Epoch	4	MSE:	0.019385751336812973
Epoch	5	MSE:	0.01609146036207676
Epoch	6	MSE:	0.012499547563493252
Epoch	7	MSE:	0.006333150900900364
Epoch	8	MSE:	0.00130689877551049
Epoch	9	MSE:	0.0054242610931396484
Epoch	10	MSE:	0.0032019868958741426
Epoch	11	MSE:	0.0034116581082344055
Epoch	12	MSE:	0.0037063625641167164
Epoch	13	MSE:	0.0012533346889540553
Epoch	14	MSE:	0.00012438288831617683
Epoch	15	MSE:	0.0011515613878145814
Epoch	16	MSE:	0.0022644379641860723
Epoch	17	MSE:	0.0021307356655597687
Epoch	18	MSE:	0.001329698832705617
Epoch	19	MSE:	0.0008679901948198676
Epoch	20	MSE:	0.0009972482221201062
Epoch	21	MSE:	0.0012123000342398882
Epoch	22	MSE:	0.000982549856416881
Epoch	23	MSE:	0.0003899401635862887
Epoch	24	MSE:	2.4583809135947376e-05
Epoch	25	MSE:	0.0002578807179816067
Epoch	26	MSE:	0.0007007899112068117
Epoch	27	MSE:	0.0007229364709928632
Epoch	28	MSE:	0.00039246081723831594
Epoch	29	MSE:	0.0002276269078720361
Epoch	30	MSE:	0.0003421533037908375
Epoch	31	MSE:	0.00041619170224294066
Epoch	32	MSE:	0.00027100834995508194
Epoch	33	MSE:	7.345883204834536e-05
Epoch	34	MSE:	4.323372195358388e-05
Epoch	35	MSE:	0.0001751405216054991
Epoch	36	MSE:	0.00028677834779955447
Epoch	37	MSE:	0.0002595325349830091
Epoch	38	MSE:	0.00015424138109665364
Epoch	39	MSE:	9.81431730906479e-05
Epoch	40	MSE:	0.00012496391718741506

Epoch 41 MSE: 0.0001571471948409453
Epoch 42 MSE: 0.00012262188829481602
Epoch 43 MSE: 4.882370922132395e-05
Epoch 44 MSE: 2.073196264973376e-05
Epoch 45 MSE: 6.415956886485219e-05
Epoch 46 MSE: 0.00011267148511251435
Epoch 47 MSE: 0.00010373230907134712
Epoch 48 MSE: 6.0736158047802746e-05
Epoch 49 MSE: 4.3898671719944105e-05
Epoch 50 MSE: 6.025829497957602e-05
Epoch 51 MSE: 6.741538527421653e-05
Epoch 52 MSE: 4.517939669312909e-05
Epoch 53 MSE: 2.1070671209599823e-05
Epoch 54 MSE: 2.4577529984526336e-05
Epoch 55 MSE: 4.605635331245139e-05
Epoch 56 MSE: 5.4881882533663884e-05
Epoch 57 MSE: 4.257834007148631e-05
Epoch 58 MSE: 2.8912132620462216e-05
Epoch 59 MSE: 2.9567609090008773e-05
Epoch 60 MSE: 3.6037134123034775e-05
Epoch 61 MSE: 3.281224053353071e-05
Epoch 62 MSE: 2.173690518247895e-05
Epoch 63 MSE: 1.765979868650902e-05
Epoch 64 MSE: 2.490286533429753e-05
Epoch 65 MSE: 3.1519317417405546e-05
Epoch 66 MSE: 2.8475295039243065e-05
Epoch 67 MSE: 2.1965490304864943e-05
Epoch 68 MSE: 2.1153631678316742e-05
Epoch 69 MSE: 2.4037433831836097e-05
Epoch 70 MSE: 2.3189702915260568e-05
Epoch 71 MSE: 1.869862899184227e-05
Epoch 72 MSE: 1.7047868823283352e-05
Epoch 73 MSE: 2.0069555830559693e-05
Epoch 74 MSE: 2.2596925191464834e-05
Epoch 75 MSE: 2.112187576130964e-05
Epoch 76 MSE: 1.8536058632889763e-05
Epoch 77 MSE: 1.8433616787660867e-05
Epoch 78 MSE: 1.9552699086489156e-05
Epoch 79 MSE: 1.8884154997067526e-05
Epoch 80 MSE: 1.7018197468132712e-05
Epoch 81 MSE: 1.67715461429907e-05
Epoch 82 MSE: 1.8239665223518386e-05
Epoch 83 MSE: 1.8876366084441543e-05
Epoch 84 MSE: 1.7863925677374937e-05
Epoch 85 MSE: 1.7021719031617977e-05
Epoch 86 MSE: 1.733940553094726e-05
Epoch 87 MSE: 1.7598360500414856e-05
Epoch 88 MSE: 1.6943493392318487e-05

Epoch 89 MSE: 1.6356005289708264e-05
Epoch 90 MSE: 1.6714076991775073e-05
Epoch 91 MSE: 1.7275038771913387e-05
Epoch 92 MSE: 1.7100881450460292e-05
Epoch 93 MSE: 1.65865621966077e-05
Epoch 94 MSE: 1.6525815226486884e-05
Epoch 95 MSE: 1.672210964898113e-05
Epoch 96 MSE: 1.6566553313168697e-05
Epoch 97 MSE: 1.6223437341977842e-05
Epoch 98 MSE: 1.624162177904509e-05
Epoch 99 MSE: 1.6512673028046265e-05
T-time: 153.45307683944702

=====
Train Score: 0.12 RMSE
=====
Validation Score: 1.53 RMSE
=====

=====
Time Step = 100 | Hidden States = 32 | Num Layers = 2
=====

Epoch 0 MSE: 0.07239608466625214
Epoch 1 MSE: 0.0533328503370285
Epoch 2 MSE: 0.04271842911839485
Epoch 3 MSE: 0.02913602441549301
Epoch 4 MSE: 0.02877665124833584
Epoch 5 MSE: 0.028437921777367592
Epoch 6 MSE: 0.021063096821308136
Epoch 7 MSE: 0.011573794297873974
Epoch 8 MSE: 0.008774315938353539
Epoch 9 MSE: 0.009984697215259075
Epoch 10 MSE: 0.0025957238394767046
Epoch 11 MSE: 0.0027660687919706106
Epoch 12 MSE: 0.009001781232655048
Epoch 13 MSE: 0.004570898599922657
Epoch 14 MSE: 0.0002907304442487657
Epoch 15 MSE: 0.0012784635182470083
Epoch 16 MSE: 0.0032877177000045776
Epoch 17 MSE: 0.0033262385986745358
Epoch 18 MSE: 0.002422330202534795
Epoch 19 MSE: 0.001988090807572007
Epoch 20 MSE: 0.002108197659254074
Epoch 21 MSE: 0.0021005277521908283
Epoch 22 MSE: 0.0014739141333848238
Epoch 23 MSE: 0.0005119530251249671
Epoch 24 MSE: 0.00014569360064342618

Epoch	25	MSE:	0.0008617199491709471
Epoch	26	MSE:	0.0016119526699185371
Epoch	27	MSE:	0.0012539724120870233
Epoch	28	MSE:	0.0004400770412757993
Epoch	29	MSE:	0.00016250523913186044
Epoch	30	MSE:	0.00037983604124747217
Epoch	31	MSE:	0.0005867442232556641
Epoch	32	MSE:	0.0005561882862821221
Epoch	33	MSE:	0.0004166802973486483
Epoch	34	MSE:	0.0003719787928275764
Epoch	35	MSE:	0.00044736111885868013
Epoch	36	MSE:	0.00047611017362214625
Epoch	37	MSE:	0.00032965204445645213
Epoch	38	MSE:	0.00011155381798744202
Epoch	39	MSE:	3.864235623041168e-05
Epoch	40	MSE:	0.00016215584764722735
Epoch	41	MSE:	0.00030992733081802726
Epoch	42	MSE:	0.0003102351911365986
Epoch	43	MSE:	0.0001871998974820599
Epoch	44	MSE:	9.100195165956393e-05
Epoch	45	MSE:	9.263315587304533e-05
Epoch	46	MSE:	0.00012612967111635953
Epoch	47	MSE:	0.0001191837654914707
Epoch	48	MSE:	9.005325409816578e-05
Epoch	49	MSE:	9.128712554229423e-05
Epoch	50	MSE:	0.00012252951273694634
Epoch	51	MSE:	0.000134940622956492
Epoch	52	MSE:	9.949583909474313e-05
Epoch	53	MSE:	4.580480890581384e-05
Epoch	54	MSE:	2.7197278541279957e-05
Epoch	55	MSE:	5.469685129355639e-05
Epoch	56	MSE:	8.475875802105293e-05
Epoch	57	MSE:	8.023604459594935e-05
Epoch	58	MSE:	5.577812044066377e-05
Epoch	59	MSE:	4.4238164264243096e-05
Epoch	60	MSE:	4.814324711333029e-05
Epoch	61	MSE:	4.797943256562576e-05
Epoch	62	MSE:	3.840269346255809e-05
Epoch	63	MSE:	3.364432996022515e-05
Epoch	64	MSE:	4.186585283605382e-05
Epoch	65	MSE:	5.106940443511121e-05
Epoch	66	MSE:	4.652586721931584e-05
Epoch	67	MSE:	3.2199393899645656e-05
Epoch	68	MSE:	2.4409619072685018e-05
Epoch	69	MSE:	2.8966527679585852e-05
Epoch	70	MSE:	3.572823334252462e-05
Epoch	71	MSE:	3.526854925439693e-05
Epoch	72	MSE:	3.06549045490101e-05

```

Epoch 73 MSE: 2.9069882657495327e-05
Epoch 74 MSE: 2.992342342622578e-05
Epoch 75 MSE: 2.8231610485818237e-05
Epoch 76 MSE: 2.465201760060154e-05
Epoch 77 MSE: 2.4231949282693677e-05
Epoch 78 MSE: 2.74564117717091e-05
Epoch 79 MSE: 2.9265842385939322e-05
Epoch 80 MSE: 2.6815683668246493e-05
Epoch 81 MSE: 2.3288099328055978e-05
Epoch 82 MSE: 2.2641741452389397e-05
Epoch 83 MSE: 2.413346192042809e-05
Epoch 84 MSE: 2.461212352500297e-05
Epoch 85 MSE: 2.3691178284934722e-05
Epoch 86 MSE: 2.3285147108254023e-05
Epoch 87 MSE: 2.3626877009519376e-05
Epoch 88 MSE: 2.3193537344923243e-05
Epoch 89 MSE: 2.189729639212601e-05
Epoch 90 MSE: 2.1400766854640096e-05
Epoch 91 MSE: 2.2225065549719147e-05
Epoch 92 MSE: 2.287171082571149e-05
Epoch 93 MSE: 2.2289423213806003e-05
Epoch 94 MSE: 2.1346897483454086e-05
Epoch 95 MSE: 2.1145564460312016e-05
Epoch 96 MSE: 2.1393236238509417e-05
Epoch 97 MSE: 2.1325811758288182e-05
Epoch 98 MSE: 2.106836109305732e-05
Epoch 99 MSE: 2.110070090566296e-05
T-time: 294.38343834877014

```

```

=====
Train Score: 0.14 RMSE
=====
Validation Score: 4.34 RMSE
=====

```

```
[44]: GRU_results = pd.DataFrame(GRU_results, columns=['time_step', 'num_layers', '
↳ 'hidden_dim', 'trainScore', 'valScore'], index = None)
```

```
[45]: GRU_results = GRU_results.sort_values('valScore', ascending=True, ignore_index_
↳ = True)
GRU_results
```

```
[45]:
```

	time_step	num_layers	hidden_dim	trainScore	valScore
0	30.0	1.0	32.0	0.121688	1.489080
1	50.0	1.0	32.0	0.120972	1.502946
2	20.0	1.0	32.0	0.128503	1.512104

3	100.0	1.0	32.0	0.121259	1.532707
4	30.0	2.0	32.0	0.136286	4.192031
5	50.0	2.0	32.0	0.135944	4.199677
6	20.0	2.0	32.0	0.151878	4.233510
7	20.0	1.0	16.0	0.190952	4.304657
8	30.0	1.0	16.0	0.190652	4.307209
9	100.0	2.0	32.0	0.137073	4.337277
10	50.0	1.0	16.0	0.190993	4.356044
11	100.0	1.0	16.0	0.191380	4.456633
12	20.0	2.0	8.0	0.226076	6.099865
13	30.0	2.0	8.0	0.225242	6.123375
14	50.0	2.0	8.0	0.223641	6.156028
15	100.0	2.0	8.0	0.225360	6.304582
16	20.0	1.0	8.0	0.282497	6.564267
17	30.0	1.0	8.0	0.281694	6.584753
18	50.0	1.0	8.0	0.281779	6.636743
19	100.0	1.0	8.0	0.281901	6.781397
20	30.0	2.0	16.0	0.188312	7.030815
21	20.0	2.0	16.0	0.197614	7.040757
22	50.0	2.0	16.0	0.192309	7.111733
23	20.0	1.0	2.0	0.254993	7.225485
24	30.0	1.0	2.0	0.255085	7.254680
25	100.0	2.0	16.0	0.192644	7.288656
26	50.0	1.0	2.0	0.255254	7.316706
27	100.0	1.0	2.0	0.255664	7.488473
28	30.0	1.0	4.0	0.504123	11.709023
29	20.0	1.0	4.0	0.508851	11.723496
30	50.0	1.0	4.0	0.503882	11.793684
31	100.0	1.0	4.0	0.504372	12.049944
32	20.0	2.0	4.0	0.681148	12.692479
33	30.0	2.0	4.0	0.679634	12.744185
34	50.0	2.0	4.0	0.677197	12.781754
35	100.0	2.0	4.0	0.682841	13.133805
36	30.0	2.0	2.0	0.599233	13.742081
37	20.0	2.0	2.0	0.625895	13.775087
38	50.0	2.0	2.0	0.583369	13.794446
39	100.0	2.0	2.0	0.580593	14.090509

0.17 Selecting Best Model (GRU Model)

```
[46]: best_gru_model = GRU_results.iloc[0]
      best_gru_model
```

```
[46]: time_step      30.000000
      num_layers      1.000000
      hidden_dim     32.000000
      trainScore      0.121688
```



```
valScore          1.489080
Name: 0, dtype: float64
```

```
[47]: input_dim = 1
      output_dim = 1
      num_epochs = 100
      lr = 0.01
      loss_type = torch.nn.MSELoss(reduction='mean')
      optimiser = torch.optim.Adam

      hidden_dim = int(best_gru_model['hidden_dim'])
      num_layers = int(best_gru_model['num_layers'])
      time_step = int(best_gru_model['time_step'])

      torch.manual_seed(42)
      tune_gru = GRU_model(input_dim = input_dim, hidden_dim = hidden_dim, output_dim=
      ↪ output_dim, layer_dim = num_layers)
      tune_gru = to_device(tune_gru, device)

      evaluate_single_model(tune_gru, num_epochs, lr, loss_type, optimiser, time_step)
```

```
Epoch 0 MSE: 0.042843353003263474
Epoch 1 MSE: 0.03270935267210007
Epoch 2 MSE: 0.03124498762190342
Epoch 3 MSE: 0.025008242577314377
Epoch 4 MSE: 0.019258633255958557
Epoch 5 MSE: 0.01602357067167759
Epoch 6 MSE: 0.012408273294568062
Epoch 7 MSE: 0.006237407214939594
Epoch 8 MSE: 0.0013294810196384788
Epoch 9 MSE: 0.005380404647439718
Epoch 10 MSE: 0.003150835633277893
Epoch 11 MSE: 0.0034945064689964056
Epoch 12 MSE: 0.0036857377272099257
Epoch 13 MSE: 0.0011881171958521008
Epoch 14 MSE: 0.00012308255827520043
Epoch 15 MSE: 0.0011960119009017944
Epoch 16 MSE: 0.002275234553962946
Epoch 17 MSE: 0.00209730863571167
Epoch 18 MSE: 0.0013001244515180588
Epoch 19 MSE: 0.0008742795325815678
Epoch 20 MSE: 0.0010253657819703221
Epoch 21 MSE: 0.0012263153912499547
Epoch 22 MSE: 0.0009674275061115623
Epoch 23 MSE: 0.00036626734072342515
Epoch 24 MSE: 2.199248774559237e-05
Epoch 25 MSE: 0.000276678561931476
Epoch 26 MSE: 0.0007096833433024585
```

Epoch 27 MSE: 0.0007076485198922455
 Epoch 28 MSE: 0.0003773518546950072
 Epoch 29 MSE: 0.00023356100427918136
 Epoch 30 MSE: 0.0003572253917809576
 Epoch 31 MSE: 0.0004187347658444196
 Epoch 32 MSE: 0.0002599924337118864
 Epoch 33 MSE: 6.487038626801223e-05
 Epoch 34 MSE: 4.685270687332377e-05
 Epoch 35 MSE: 0.00018392264610156417
 Epoch 36 MSE: 0.00028856840799562633
 Epoch 37 MSE: 0.00025293664657510817
 Epoch 38 MSE: 0.00014842422388028353
 Epoch 39 MSE: 9.997732558986172e-05
 Epoch 40 MSE: 0.00013119098730385303
 Epoch 41 MSE: 0.00015975291898939759
 Epoch 42 MSE: 0.00011916370567632839
 Epoch 43 MSE: 4.474912566365674e-05
 Epoch 44 MSE: 2.1532297978410497e-05
 Epoch 45 MSE: 6.806514284107834e-05
 Epoch 46 MSE: 0.00011381167132640257
 Epoch 47 MSE: 0.00010091196600114927
 Epoch 48 MSE: 5.859638986294158e-05
 Epoch 49 MSE: 4.551849633571692e-05
 Epoch 50 MSE: 6.308012234512717e-05
 Epoch 51 MSE: 6.769868923583999e-05
 Epoch 52 MSE: 4.327630085754208e-05
 Epoch 53 MSE: 2.0194511307636276e-05
 Epoch 54 MSE: 2.5933199140126817e-05
 Epoch 55 MSE: 4.7540917876176536e-05
 Epoch 56 MSE: 5.4552918300032616e-05
 Epoch 57 MSE: 4.1355415305588394e-05
 Epoch 58 MSE: 2.8862797989859246e-05
 Epoch 59 MSE: 3.084530180785805e-05
 Epoch 60 MSE: 3.693790131364949e-05
 Epoch 61 MSE: 3.2422780350316316e-05
 Epoch 62 MSE: 2.1102938262629323e-05
 Epoch 63 MSE: 1.7991360437008552e-05
 Epoch 64 MSE: 2.5770119464141317e-05
 Epoch 65 MSE: 3.173542791046202e-05
 Epoch 66 MSE: 2.802823655656539e-05
 Epoch 67 MSE: 2.188076905440539e-05
 Epoch 68 MSE: 2.1766276404378004e-05
 Epoch 69 MSE: 2.457958908053115e-05
 Epoch 70 MSE: 2.3126533051254228e-05
 Epoch 71 MSE: 1.849148429755587e-05
 Epoch 72 MSE: 1.727827293507289e-05
 Epoch 73 MSE: 2.052927993645426e-05
 Epoch 74 MSE: 2.2747533876099624e-05

Epoch 75 MSE: 2.0996923922211863e-05
Epoch 76 MSE: 1.8605282093631104e-05
Epoch 77 MSE: 1.8796945369103923e-05
Epoch 78 MSE: 1.9834669728879817e-05
Epoch 79 MSE: 1.8893922970164567e-05
Epoch 80 MSE: 1.7019039660226554e-05
Epoch 81 MSE: 1.6985188267426565e-05
Epoch 82 MSE: 1.849424916144926e-05
Epoch 83 MSE: 1.89548318303423e-05
Epoch 84 MSE: 1.787653673090972e-05
Epoch 85 MSE: 1.7174419554066844e-05
Epoch 86 MSE: 1.757402060320601e-05
Epoch 87 MSE: 1.7728389138937928e-05
Epoch 88 MSE: 1.698232881608419e-05
Epoch 89 MSE: 1.645882184675429e-05
Epoch 90 MSE: 1.6893620340852067e-05
Epoch 91 MSE: 1.7405978724127635e-05
Epoch 92 MSE: 1.7158952687168494e-05
Epoch 93 MSE: 1.667603282839991e-05
Epoch 94 MSE: 1.668017102929298e-05
Epoch 95 MSE: 1.685604001977481e-05
Epoch 96 MSE: 1.664023511693813e-05
Epoch 97 MSE: 1.6302572475979105e-05
Epoch 98 MSE: 1.6365260307793505e-05
Epoch 99 MSE: 1.6629777746857144e-05
T-time: 41.05872082710266

=====
Train Score: 0.12 RMSE
=====
Validation Score: 1.49 RMSE
=====



0.18 Test Final Model

```
[48]: input_dim = 1
output_dim = 1
num_epochs = 100
lr = 0.01
loss_type = torch.nn.MSELoss(reduction = 'mean')
optimiser = torch.optim.Adam

hidden_dim = int(best_rnn_model['hidden_dim'])
num_layers = int(best_rnn_model['num_layers'])
time_step = int(best_rnn_model['time_step'])

torch.manual_seed(42)
final_model = RNN_relu(input_dim = input_dim, hidden_dim = hidden_dim,
    ↪output_dim = output_dim, layer_dim = num_layers)
final_model = to_device(final_model, device)

test_final_model(final_model, num_epochs, lr, loss_type, optimiser, time_step)
```

```
Epoch 0 MSE: 0.09753220528364182
Epoch 1 MSE: 0.045439865440130234
Epoch 2 MSE: 0.05725377798080444
```

Epoch 3 MSE: 0.05065715312957764
 Epoch 4 MSE: 0.041713666170835495
 Epoch 5 MSE: 0.038108691573143005
 Epoch 6 MSE: 0.037308428436517715
 Epoch 7 MSE: 0.03632259741425514
 Epoch 8 MSE: 0.033460088074207306
 Epoch 9 MSE: 0.02942574955523014
 Epoch 10 MSE: 0.02554478868842125
 Epoch 11 MSE: 0.023359300568699837
 Epoch 12 MSE: 0.02138330787420273
 Epoch 13 MSE: 0.013197357766330242
 Epoch 14 MSE: 0.0068166968412697315
 Epoch 15 MSE: 0.003802439197897911
 Epoch 16 MSE: 0.0014066006988286972
 Epoch 17 MSE: 0.0034302102867513895
 Epoch 18 MSE: 0.005794005002826452
 Epoch 19 MSE: 0.003911020699888468
 Epoch 20 MSE: 0.0050425343215465546
 Epoch 21 MSE: 0.004476758185774088
 Epoch 22 MSE: 0.002021227264776826
 Epoch 23 MSE: 0.0010002510389313102
 Epoch 24 MSE: 0.0018644134979695082
 Epoch 25 MSE: 0.0016121662920340896
 Epoch 26 MSE: 0.0009011440561152995
 Epoch 27 MSE: 0.0014458342920988798
 Epoch 28 MSE: 0.0022129896096885204
 Epoch 29 MSE: 0.0021586234215646982
 Epoch 30 MSE: 0.0015157395973801613
 Epoch 31 MSE: 0.0010952606098726392
 Epoch 32 MSE: 0.0009024976170621812
 Epoch 33 MSE: 0.0005764422821812332
 Epoch 34 MSE: 0.00019403033365961164
 Epoch 35 MSE: 0.00014283591008279473
 Epoch 36 MSE: 0.0003422168083488941
 Epoch 37 MSE: 0.0004511061997618526
 Epoch 38 MSE: 0.0003693542967084795
 Epoch 39 MSE: 0.00033453336800448596
 Epoch 40 MSE: 0.0003689259756356478
 Epoch 41 MSE: 0.00025166032719425857
 Epoch 42 MSE: 8.728200191399083e-05
 Epoch 43 MSE: 7.921738142613322e-05
 Epoch 44 MSE: 0.00013975825277157128
 Epoch 45 MSE: 0.00014692985860165209
 Epoch 46 MSE: 0.00015231090947054327
 Epoch 47 MSE: 0.00020833630696870387
 Epoch 48 MSE: 0.0001908188423840329
 Epoch 49 MSE: 9.97269235085696e-05
 Epoch 50 MSE: 6.680258229607716e-05

Epoch 51 MSE: 6.819955888204277e-05
 Epoch 52 MSE: 4.5153199607739225e-05
 Epoch 53 MSE: 5.777182741439901e-05
 Epoch 54 MSE: 0.00010516359907342121
 Epoch 55 MSE: 9.814016084419563e-05
 Epoch 56 MSE: 6.346753070829436e-05
 Epoch 57 MSE: 6.078607475501485e-05
 Epoch 58 MSE: 5.3198604291537777e-05
 Epoch 59 MSE: 2.5294366423622705e-05
 Epoch 60 MSE: 3.267585634603165e-05
 Epoch 61 MSE: 5.737528408644721e-05
 Epoch 62 MSE: 4.4532327592605725e-05
 Epoch 63 MSE: 4.2996598494937643e-05
 Epoch 64 MSE: 5.1285467634443194e-05
 Epoch 65 MSE: 3.502670369925909e-05
 Epoch 66 MSE: 2.4239674530690536e-05
 Epoch 67 MSE: 3.388575350982137e-05
 Epoch 68 MSE: 3.23239692079369e-05
 Epoch 69 MSE: 2.6476071070646867e-05
 Epoch 70 MSE: 3.5279586882097647e-05
 Epoch 71 MSE: 3.7377551052486524e-05
 Epoch 72 MSE: 2.8233174816705287e-05
 Epoch 73 MSE: 2.8037437004968524e-05
 Epoch 74 MSE: 2.9662693123100325e-05
 Epoch 75 MSE: 2.3611179130966775e-05
 Epoch 76 MSE: 2.4239545382442884e-05
 Epoch 77 MSE: 2.9076647479087114e-05
 Epoch 78 MSE: 2.678815508261323e-05
 Epoch 79 MSE: 2.5374663891852833e-05
 Epoch 80 MSE: 2.7432688511908054e-05
 Epoch 81 MSE: 2.4457796826027334e-05
 Epoch 82 MSE: 2.193782347603701e-05
 Epoch 83 MSE: 2.3935710487421602e-05
 Epoch 84 MSE: 2.3575506929773837e-05
 Epoch 85 MSE: 2.2655329303233884e-05
 Epoch 86 MSE: 2.4475588361383416e-05
 Epoch 87 MSE: 2.3855398467276245e-05
 Epoch 88 MSE: 2.2036441805539653e-05
 Epoch 89 MSE: 2.2613952751271427e-05
 Epoch 90 MSE: 2.2225125576369464e-05
 Epoch 91 MSE: 2.1401459889602847e-05
 Epoch 92 MSE: 2.2493764845421538e-05
 Epoch 93 MSE: 2.2600854208576493e-05
 Epoch 94 MSE: 2.183059223170858e-05
 Epoch 95 MSE: 2.2168993382365443e-05
 Epoch 96 MSE: 2.1786667275591753e-05
 Epoch 97 MSE: 2.108951230184175e-05
 Epoch 98 MSE: 2.155385482183192e-05

Epoch 99 MSE: 2.1572162950178608e-05
T-time: 16.239516973495483

```
=====
Train Score: 0.26 RMSE
=====
Test Score: 3.14 RMSE
=====
```

