

Microsoft Stock Price Forecasting

Data Source: tiingo api <https://api.tiingo.com/documentation/general/overview>

Objective: To learn how Deep neural network can be used in forecasting stock price

Reading Dataset

```
In [87]: import pandas_datareader as pdr
```

```
In [147...]: df=pdr.get_data_tiingo("MSFT",api_key="4751740f6e90d646c9df7e7ce9d05f96c87030dd")
```

```
In [148...]: df.head(10)
```

```
Out[148...]:
```

symbol	date	close	high	low	open	volume	adjClose	adjHigh	adjLow	adjOpen
MSFT	2017-08-14 00:00:00+00:00	73.59	73.72	72.95	73.06	19756773	68.910409	69.032143	68.311107	68.41411
	2017-08-15 00:00:00+00:00	73.22	73.59	73.04	73.59	17791179	68.929138	69.277455	68.759686	69.27745
	2017-08-16 00:00:00+00:00	73.65	74.10	73.17	73.34	17814317	69.333939	69.757568	68.882068	69.04210
	2017-08-17 00:00:00+00:00	72.40	73.87	72.40	73.58	21834250	68.157192	69.541046	68.157192	69.26804
	2017-08-18 00:00:00+00:00	72.49	72.84	71.93	72.27	18215276	68.241917	68.571406	67.714735	68.03481
	2017-08-21 00:00:00+00:00	72.15	72.48	71.70	72.47	17656716	67.921842	68.232503	67.498213	68.22308
	2017-08-22 00:00:00+00:00	73.16	73.24	72.35	72.35	14183146	68.872654	68.947966	68.110122	68.11012
	2017-08-23 00:00:00+00:00	72.72	73.15	72.53	72.96	13586784	68.458439	68.863240	68.279573	68.68437
	2017-08-24 00:00:00+00:00	72.69	72.86	72.07	72.74	15980144	68.430197	68.590234	67.846530	68.47726
	2017-08-25 00:00:00+00:00	72.82	73.35	72.48	72.86	12574503	68.552579	69.051519	68.232503	68.59023

◀ ▶

```
In [149...]: df.to_csv("MSFT.csv")
```

```
In [150...]: import pandas as pd
```

```
To In [151]: df=pd.read_csv("MSFT.csv")
```

Data Exploration

In [152... df.head()

	symbol	date	close	high	low	open	volume	adjClose	adjHigh	adjLow	adjO
0	MSFT	2017-08-14 00:00:00+00:00	73.59	73.72	72.95	73.06	19756773	68.910409	69.032143	68.311107	68.414
1	MSFT	2017-08-15 00:00:00+00:00	73.22	73.59	73.04	73.59	17791179	68.929138	69.277455	68.759686	69.277
2	MSFT	2017-08-16 00:00:00+00:00	73.65	74.10	73.17	73.34	17814317	69.333939	69.757568	68.882068	69.042
3	MSFT	2017-08-17 00:00:00+00:00	72.40	73.87	72.40	73.58	21834250	68.157192	69.541046	68.157192	69.268
4	MSFT	2017-08-18 00:00:00+00:00	72.49	72.84	71.93	72.27	18215276	68.241917	68.571406	67.714735	68.034

◀ ▶

In [153... df.columns

```
Out[153... Index(['symbol', 'date', 'close', 'high', 'low', 'open', 'volume', 'adjClose',
       'adjHigh', 'adjLow', 'adjOpen', 'adjVolume', 'divCash', 'splitFactor'],
      dtype='object')
```

In [154... df.info()

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1257 entries, 0 to 1256
Data columns (total 14 columns):
 #   Column        Non-Null Count  Dtype  
 --- 
 0   symbol        1257 non-null   object  
 1   date          1257 non-null   object  
 2   close          1257 non-null   float64 
 3   high           1257 non-null   float64 
 4   low            1257 non-null   float64 
 5   open           1257 non-null   float64 
 6   volume         1257 non-null   int64   
 7   adjClose       1257 non-null   float64 
 8   adjHigh        1257 non-null   float64 
 9   adjLow         1257 non-null   float64 
 10  adjOpen        1257 non-null   float64 
 11  adjVolume     1257 non-null   int64   
 12  divCash        1257 non-null   float64 
 13  splitFactor   1257 non-null   float64 
dtypes: float64(10), int64(2), object(2)
memory usage: 137.6+ KB
```

In [155... df["close"].describe()

```
Out[155... count    1257.000000
mean     180.783361
std      78.558147
min     72.150000
25%     107.710000
50%     162.010000
```

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```
max      343.110000
Name: close, dtype: float64
```

```
In [156...]: print("Start date", df.date[0])
print("End date", df.date[1256])
```

```
Start date 2017-08-14 00:00:00+00:00
End date 2022-08-10 00:00:00+00:00
```

```
In [157...]: data=df.reset_index()["close"]
```

```
In [158...]: data
```

```
Out[158...]: 0      73.59
1      73.22
2      73.65
3      72.40
4      72.49
...
1252    283.65
1253    282.91
1254    280.32
1255    282.30
1256    289.16
Name: close, Length: 1257, dtype: float64
```

```
In [ ]:
```

How Many years of data it is

```
In [159...]: weekdays=2*4*12
working_days= 365-weekdays
len(data)/working_days
```

```
Out[159...]: 4.672862453531598
```

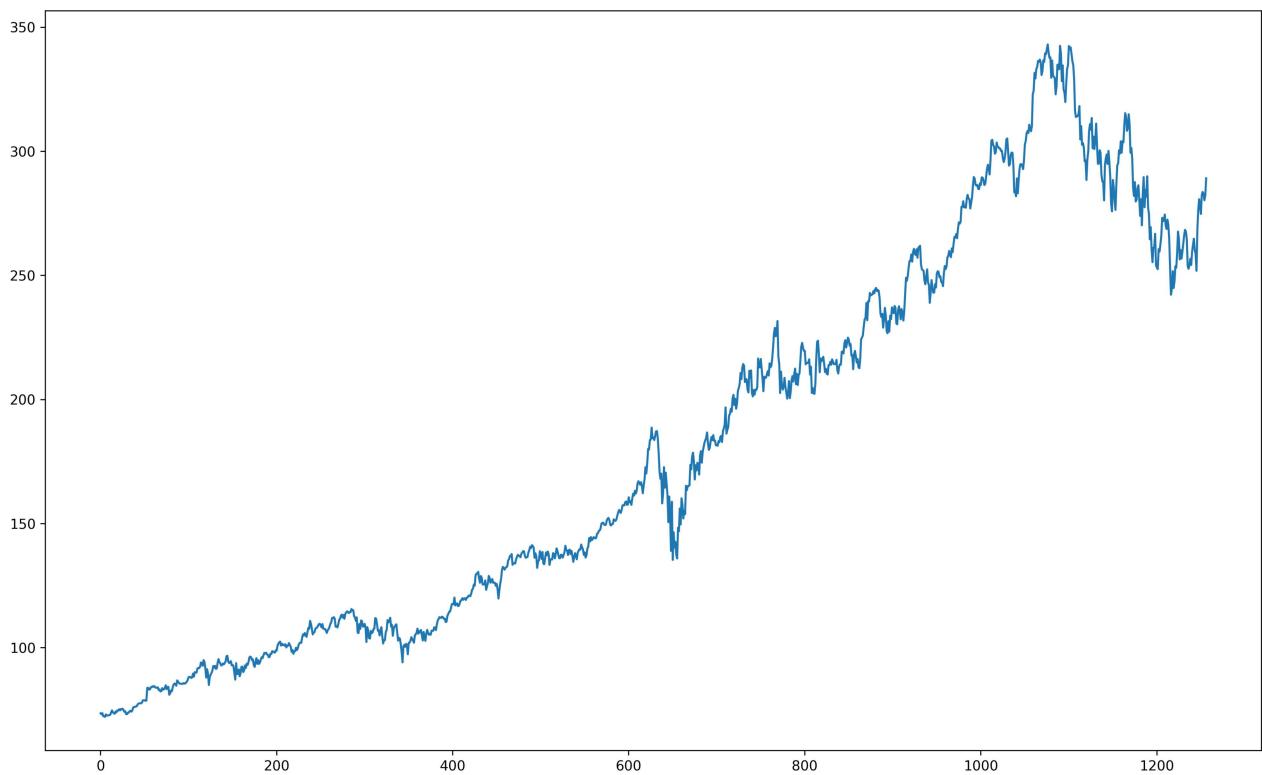
Data Visualization

So, Data is around of 5 years

```
In [160...]: import matplotlib.pyplot as plt
import seaborn as sns
```

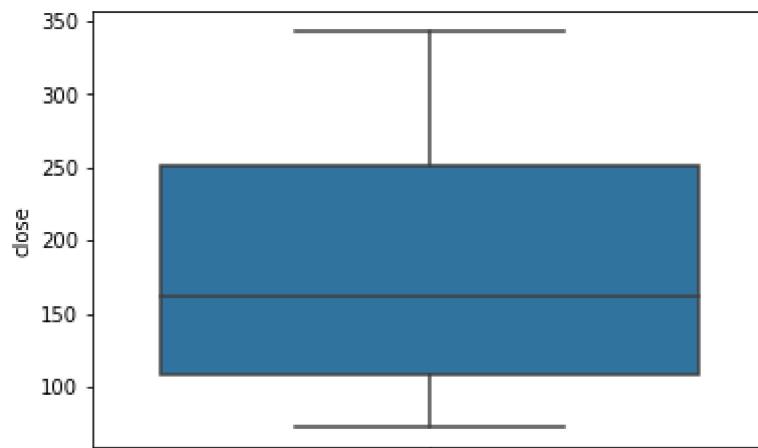
```
In [161...]: plt.figure(figsize=(16,10),dpi=320)
plt.plot(data)
```

```
Out[161...]: [matplotlib.lines.Line2D at 0x22357362c70>]
```



```
In [162... sns.boxplot(y=data)
```

```
Out[162... <AxesSubplot:ylabel='close'>
```



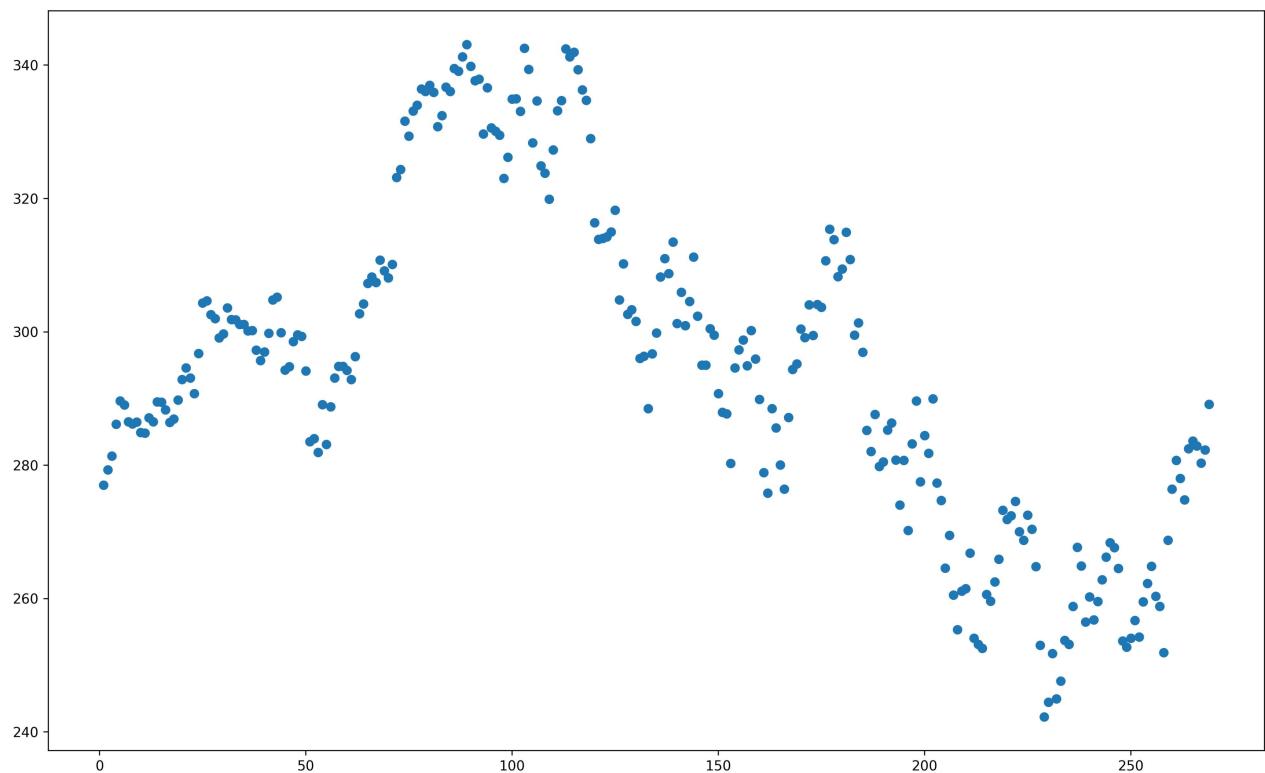
Data Does not have any outlier

One Year Dataset

```
In [163... plt.figure(figsize=(16,10),dpi=320)
plt.scatter(np.arange(start=1,stop=270),data[(1257-365+2*4*12):])
```

```
Out[163... <matplotlib.collections.PathCollection at 0x223573d4c40>
```

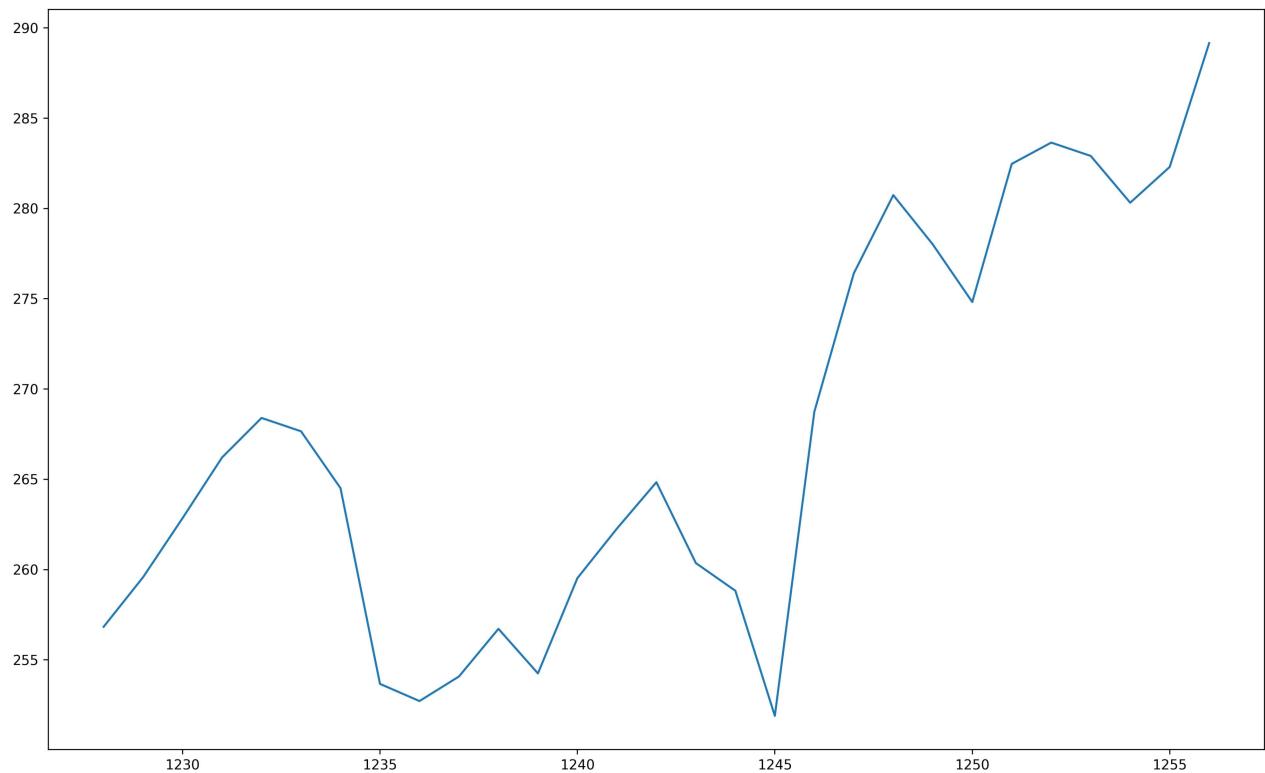
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One Month Data

```
In [164...]: plt.figure(figsize=(16,10),dpi=320)
plt.plot(data[(1258-30):])
```

```
Out[164...]: <matplotlib.lines.Line2D at 0x22357428a00>
```



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Feature Scaling (Normalization)

```
In [166...]: from sklearn.preprocessing import MinMaxScaler
scaler=MinMaxScaler(feature_range=(0,1))

In [167...]: df1=scaler.fit_transform(np.array(data).reshape(-1,1))

In [168...]: df1

Out[168...]: array([[0.00531444],
       [0.00394892],
       [0.00553587],
       ...,
       [0.76826838],
       [0.77557573],
       [0.80089312]])
```

Train Test Split

```
In [169...]: train_size=int(len(df1)*0.65)
test_size=len(df1)-train_size
train_data, test_data=df1[0:train_size,:],df1[train_size:len(df1),:1]

In [170...]: test_data[:5,0]

Out[170...]: array([0.51247417, 0.53291999, 0.52882344, 0.53277236, 0.53542958])

In [171...]: train_size, test_size

Out[171...]: (817, 440)

In [172...]: import numpy
```

Converting time series data to dataset Matrix

```
In [173...]: def create_dataset(dataset,timestamp=1):
    dataX, dataY =[], []
    for i in range(len(dataset)-timestamp-1):
        a=dataset[i:(i+timestamp) , 0 ]
        dataX.append(a)
        dataY.append(dataset[i + timestamp, 0])
    return numpy.array(dataX), numpy.array(dataY)

In [174...]: timestamp=100
X_train, y_train = create_dataset(train_data, timestamp)
X_test, ytest =create_dataset(test_data, timestamp)

In [175...]: 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)

In [176...]: from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import Dense
from tensorflow.keras.layers import LSTM
```

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```
In [177...]: model=Sequential()
model.add(LSTM(50,return_sequences=True,input_shape=(100,1)))
model.add(LSTM(50,return_sequences=True))
model.add(LSTM(50))
model.add(Dense(1))
model.compile(loss="mean_squared_error",optimizer="adam")
```

```
In [178...]: model.summary()
```

Model: "sequential_4"

Layer (type)	Output Shape	Param #
lstm_12 (LSTM)	(None, 100, 50)	10400
lstm_13 (LSTM)	(None, 100, 50)	20200
lstm_14 (LSTM)	(None, 50)	20200
dense_4 (Dense)	(None, 1)	51

Total params: 50,851
Trainable params: 50,851
Non-trainable params: 0

```
In [179...]: model.fit(X_train,y_train,validation_data=(X_test,ytest),epochs=100,batch_size=64,verbo
```

Epoch 1/100
12/12 [=====] - 8s 253ms/step - loss: 0.0192 - val_loss: 0.0868
Epoch 2/100
12/12 [=====] - 2s 134ms/step - loss: 0.0043 - val_loss: 0.0032
Epoch 3/100
12/12 [=====] - 2s 132ms/step - loss: 0.0015 - val_loss: 0.0024
Epoch 4/100
12/12 [=====] - 1s 124ms/step - loss: 0.0012 - val_loss: 0.0040
Epoch 5/100
12/12 [=====] - 1s 123ms/step - loss: 6.7287e-04 - val_loss: 0.0052
Epoch 6/100
12/12 [=====] - 2s 135ms/step - loss: 7.0420e-04 - val_loss: 0.0023
Epoch 7/100
12/12 [=====] - 2s 132ms/step - loss: 6.2419e-04 - val_loss: 0.0026
Epoch 8/100
12/12 [=====] - 2s 135ms/step - loss: 5.7129e-04 - val_loss: 0.0038
Epoch 9/100
12/12 [=====] - 2s 136ms/step - loss: 5.9180e-04 - val_loss: 0.0042
Epoch 10/100
12/12 [=====] - 2s 133ms/step - loss: 5.5681e-04 - val_loss: 0.0038
Epoch 11/100
12/12 [=====] - 2s 130ms/step - loss: 5.5181e-04 - val_loss: 0.0035
Epoch 12/100
12/12 [=====] - 1s 123ms/step - loss: 5.6038e-04 - val_loss: 0.0040
Epoch 13/100

Loading [MathJax]/jax/output/CommonHTML/fonts/TeX/fontdata.js] - 1s 123ms/step - loss: 5.6661e-04 - val_loss: 0.0041

```
Epoch 14/100
12/12 [=====] - 1s 124ms/step - loss: 5.4005e-04 - val_loss: 0.
0034
Epoch 15/100
12/12 [=====] - 1s 125ms/step - loss: 5.5230e-04 - val_loss: 0.
0023
Epoch 16/100
12/12 [=====] - 2s 128ms/step - loss: 5.7050e-04 - val_loss: 0.
0030
Epoch 17/100
12/12 [=====] - 1s 122ms/step - loss: 5.2506e-04 - val_loss: 0.
0025
Epoch 18/100
12/12 [=====] - 1s 125ms/step - loss: 5.5315e-04 - val_loss: 0.
0026
Epoch 19/100
12/12 [=====] - 2s 137ms/step - loss: 5.3453e-04 - val_loss: 0.
0022
Epoch 20/100
12/12 [=====] - 2s 138ms/step - loss: 6.2836e-04 - val_loss: 0.
0038
Epoch 21/100
12/12 [=====] - 2s 128ms/step - loss: 5.7882e-04 - val_loss: 0.
0052
Epoch 22/100
12/12 [=====] - 2s 134ms/step - loss: 5.5894e-04 - val_loss: 0.
0052
Epoch 23/100
12/12 [=====] - 1s 123ms/step - loss: 5.1792e-04 - val_loss: 0.
0031
Epoch 24/100
12/12 [=====] - 1s 122ms/step - loss: 5.0980e-04 - val_loss: 0.
0034
Epoch 25/100
12/12 [=====] - 1s 122ms/step - loss: 4.9564e-04 - val_loss: 0.
0023
Epoch 26/100
12/12 [=====] - 2s 130ms/step - loss: 5.3777e-04 - val_loss: 0.
0024
Epoch 27/100
12/12 [=====] - 1s 123ms/step - loss: 4.8665e-04 - val_loss: 0.
0056
Epoch 28/100
12/12 [=====] - 2s 129ms/step - loss: 5.4058e-04 - val_loss: 0.
0042
Epoch 29/100
12/12 [=====] - 2s 126ms/step - loss: 5.0198e-04 - val_loss: 0.
0026
Epoch 30/100
12/12 [=====] - 1s 124ms/step - loss: 4.8099e-04 - val_loss: 0.
0039
Epoch 31/100
12/12 [=====] - 1s 124ms/step - loss: 4.7503e-04 - val_loss: 0.
0049
Epoch 32/100
12/12 [=====] - 1s 125ms/step - loss: 4.6392e-04 - val_loss: 0.
0023
Epoch 33/100
12/12 [=====] - 1s 125ms/step - loss: 4.6608e-04 - val_loss: 0.
0024
Epoch 34/100
12/12 [=====] - 1s 124ms/step - loss: 4.6831e-04 - val_loss: 0.
0071
```

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```
12/12 [=====] - 2s 128ms/step - loss: 6.5425e-04 - val_loss: 0.
```

```
0077
Epoch 36/100
12/12 [=====] - 2s 129ms/step - loss: 5.4390e-04 - val_loss: 0.
0022
Epoch 37/100
12/12 [=====] - 2s 130ms/step - loss: 4.8288e-04 - val_loss: 0.
0032
Epoch 38/100
12/12 [=====] - 2s 128ms/step - loss: 4.4626e-04 - val_loss: 0.
0052
Epoch 39/100
12/12 [=====] - 2s 131ms/step - loss: 4.5211e-04 - val_loss: 0.
0036
Epoch 40/100
12/12 [=====] - 1s 123ms/step - loss: 4.3863e-04 - val_loss: 0.
0026
Epoch 41/100
12/12 [=====] - 1s 124ms/step - loss: 4.1328e-04 - val_loss: 0.
0028
Epoch 42/100
12/12 [=====] - 2s 129ms/step - loss: 4.0180e-04 - val_loss: 0.
0027
Epoch 43/100
12/12 [=====] - 1s 125ms/step - loss: 4.0747e-04 - val_loss: 0.
0038
Epoch 44/100
12/12 [=====] - 1s 124ms/step - loss: 3.8963e-04 - val_loss: 0.
0045
Epoch 45/100
12/12 [=====] - 2s 126ms/step - loss: 3.9504e-04 - val_loss: 0.
0049
Epoch 46/100
12/12 [=====] - 2s 127ms/step - loss: 4.6331e-04 - val_loss: 0.
0018
Epoch 47/100
12/12 [=====] - 1s 124ms/step - loss: 5.1133e-04 - val_loss: 0.
0013
Epoch 48/100
12/12 [=====] - 2s 129ms/step - loss: 4.0780e-04 - val_loss: 0.
0028
Epoch 49/100
12/12 [=====] - 2s 130ms/step - loss: 3.8224e-04 - val_loss: 0.
0042
Epoch 50/100
12/12 [=====] - 1s 123ms/step - loss: 3.6710e-04 - val_loss: 0.
0046
Epoch 51/100
12/12 [=====] - 1s 123ms/step - loss: 4.4713e-04 - val_loss: 0.
0017
Epoch 52/100
12/12 [=====] - 2s 127ms/step - loss: 3.6535e-04 - val_loss: 0.
0062
Epoch 53/100
12/12 [=====] - 1s 124ms/step - loss: 3.8168e-04 - val_loss: 0.
0015
Epoch 54/100
12/12 [=====] - 1s 124ms/step - loss: 3.5088e-04 - val_loss: 0.
0041
Epoch 55/100
12/12 [=====] - 2s 125ms/step - loss: 3.5299e-04 - val_loss: 0.
0021
Epoch 56/100
12/12 [=====] - 2s 128ms/step - loss: 3.2509e-04 - val_loss: 0.
```

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Epoch 57/100

```
12/12 [=====] - 2s 128ms/step - loss: 3.3317e-04 - val_loss: 0.  
0055  
Epoch 58/100  
12/12 [=====] - 2s 127ms/step - loss: 4.1442e-04 - val_loss: 0.  
0033  
Epoch 59/100  
12/12 [=====] - 2s 131ms/step - loss: 3.4417e-04 - val_loss: 0.  
0017  
Epoch 60/100  
12/12 [=====] - 2s 126ms/step - loss: 3.2679e-04 - val_loss: 0.  
0040  
Epoch 61/100  
12/12 [=====] - 2s 129ms/step - loss: 3.5080e-04 - val_loss: 0.  
0038  
Epoch 62/100  
12/12 [=====] - 2s 130ms/step - loss: 3.2184e-04 - val_loss: 0.  
0025  
Epoch 63/100  
12/12 [=====] - 2s 126ms/step - loss: 3.0602e-04 - val_loss: 0.  
0019  
Epoch 64/100  
12/12 [=====] - 2s 126ms/step - loss: 3.2726e-04 - val_loss: 0.  
0024  
Epoch 65/100  
12/12 [=====] - 1s 125ms/step - loss: 3.3113e-04 - val_loss: 0.  
0015  
Epoch 66/100  
12/12 [=====] - 2s 131ms/step - loss: 3.2332e-04 - val_loss: 0.  
0029  
Epoch 67/100  
12/12 [=====] - 2s 126ms/step - loss: 3.1498e-04 - val_loss: 0.  
0016  
Epoch 68/100  
12/12 [=====] - 2s 126ms/step - loss: 3.0992e-04 - val_loss: 0.  
0027  
Epoch 69/100  
12/12 [=====] - 1s 125ms/step - loss: 2.9423e-04 - val_loss: 0.  
0023  
Epoch 70/100  
12/12 [=====] - 1s 126ms/step - loss: 3.2070e-04 - val_loss: 0.  
0013  
Epoch 71/100  
12/12 [=====] - 1s 125ms/step - loss: 3.3894e-04 - val_loss: 0.  
0022  
Epoch 72/100  
12/12 [=====] - 2s 128ms/step - loss: 3.2557e-04 - val_loss: 0.  
0013  
Epoch 73/100  
12/12 [=====] - 1s 125ms/step - loss: 4.1594e-04 - val_loss: 0.  
0020  
Epoch 74/100  
12/12 [=====] - 1s 124ms/step - loss: 2.9679e-04 - val_loss: 0.  
0018  
Epoch 75/100  
12/12 [=====] - 2s 130ms/step - loss: 3.1171e-04 - val_loss: 0.  
0033  
Epoch 76/100  
12/12 [=====] - 2s 126ms/step - loss: 3.1375e-04 - val_loss: 0.  
0011  
Epoch 77/100  
12/12 [=====] - 1s 126ms/step - loss: 3.5332e-04 - val_loss: 0.  
0040  
Epoch 78/100  
Loading [MathJax]/jax/output/CommonHTML/fonts/TeX/fontdata.js ] - 2s 126ms/step - loss: 3.2485e-04 - val_loss: 0.  
0012
```

```
Epoch 79/100
12/12 [=====] - 2s 126ms/step - loss: 2.9933e-04 - val_loss: 0.
0036
Epoch 80/100
12/12 [=====] - 2s 133ms/step - loss: 2.9966e-04 - val_loss: 0.
0010
Epoch 81/100
12/12 [=====] - 2s 129ms/step - loss: 3.1468e-04 - val_loss: 0.
0021
Epoch 82/100
12/12 [=====] - 2s 127ms/step - loss: 2.8702e-04 - val_loss: 0.
0012
Epoch 83/100
12/12 [=====] - 2s 127ms/step - loss: 3.3238e-04 - val_loss: 0.
0019
Epoch 84/100
12/12 [=====] - 1s 124ms/step - loss: 2.9258e-04 - val_loss: 0.
0013
Epoch 85/100
12/12 [=====] - 2s 127ms/step - loss: 2.9933e-04 - val_loss: 0.
0013
Epoch 86/100
12/12 [=====] - 2s 128ms/step - loss: 3.2540e-04 - val_loss: 0.
0016
Epoch 87/100
12/12 [=====] - 1s 124ms/step - loss: 2.6930e-04 - val_loss: 0.
0039
Epoch 88/100
12/12 [=====] - 2s 130ms/step - loss: 3.0251e-04 - val_loss: 0.
0013
Epoch 89/100
12/12 [=====] - 2s 130ms/step - loss: 2.7094e-04 - val_loss: 0.
0030
Epoch 90/100
12/12 [=====] - 1s 126ms/step - loss: 2.7592e-04 - val_loss: 0.
0016
Epoch 91/100
12/12 [=====] - 2s 127ms/step - loss: 2.9220e-04 - val_loss: 0.
0011
Epoch 92/100
12/12 [=====] - 2s 130ms/step - loss: 2.7139e-04 - val_loss: 0.
0014
Epoch 93/100
12/12 [=====] - 1s 124ms/step - loss: 2.7458e-04 - val_loss: 9.
7850e-04
Epoch 94/100
12/12 [=====] - 2s 130ms/step - loss: 3.0437e-04 - val_loss: 0.
0032
Epoch 95/100
12/12 [=====] - 2s 127ms/step - loss: 3.0225e-04 - val_loss: 9.
3776e-04
Epoch 96/100
12/12 [=====] - 2s 127ms/step - loss: 3.0557e-04 - val_loss: 0.
0019
Epoch 97/100
12/12 [=====] - 1s 125ms/step - loss: 2.6593e-04 - val_loss: 0.
0013
Epoch 98/100
12/12 [=====] - 2s 130ms/step - loss: 2.7503e-04 - val_loss: 0.
0020
Epoch 99/100
12/12 [=====] - 2s 127ms/step - loss: 2.8382e-04 - val_loss: 0.
0018
```

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```
12/12 [=====] - 2s 128ms/step - loss: 3.1919e-04 - val_loss: 0.0010
```

Out[179... <keras.callbacks.History at 0x2235772fcd0>

```
In [180... train_predict=model.predict(X_train)
test_predict=model.predict(X_test)
```

```
23/23 [=====] - 2s 27ms/step
11/11 [=====] - 0s 26ms/step
```

```
In [181... train_predict=scaler.inverse_transform(train_predict)
test_predict=scaler.inverse_transform(test_predict)
```

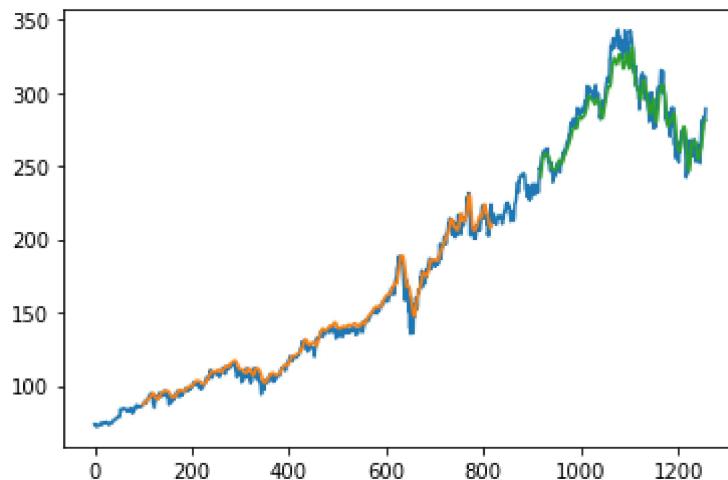
```
In [182... import math
from sklearn.metrics import mean_squared_error
math.sqrt(mean_squared_error(y_train,train_predict))
```

Out[182... 145.15197080508597

```
In [183... math.sqrt(mean_squared_error(ytest,test_predict))
```

Out[183... 284.18448778020246

```
In [184... ### Plotting
# shift train predictions for plotting
look_back=100
trainPredictPlot = numpy.empty_like(df1)
trainPredictPlot[:, :] = np.nan
trainPredictPlot[look_back:len(train_predict)+look_back, :] = train_predict
# shift test predictions for plotting
testPredictPlot = numpy.empty_like(df1)
testPredictPlot[:, :] = numpy.nan
testPredictPlot[len(train_predict)+(look_back*2)+1:len(df1)-1, :] = test_predict
# plot baseline and predictions
plt.plot(scaler.inverse_transform(df1))
plt.plot(trainPredictPlot)
plt.plot(testPredictPlot)
plt.show()
```



```
In [186... len(test_data)
```

Loading [MathJax]/jax/output/CommonHTML/fonts/TeX/fontdata.js
Out[186... 770

```
In [187...]: x_input=test_data[340: ].reshape(1, -1)
x_input.shape
```

```
Out[187...]: (1, 100)
```

```
In [188...]: temp_input=list(x_input)
temp_input=temp_input[0].tolist()
temp_input
```

```
Out[188...]: [0.8424859757897842,
 0.8377989371124888,
 0.8558827871272512,
 0.8390168290522586,
 0.8560304103926777,
 0.8544803661056981,
 0.8803882491880719,
 0.8977708886920577,
 0.8920504871567758,
 0.8715677590788307,
 0.8756643046944197,
 0.8961470327723648,
 0.8810525538824916,
 0.8390537348686151,
 0.8459551225273101,
 0.8297165633303809,
 0.7864998523767344,
 0.774689991142604,
 0.7952096250369056,
 0.7664599940950692,
 0.7690064954236786,
 0.7866474756421611,
 0.7905594921759669,
 0.7700767640980217,
 0.7450546206082076,
 0.7697446117508118,
 0.7309935045763212,
 0.7789710658399762,
 0.8026276941245938,
 0.7579347505166811,
 0.7835842928845584,
 0.7736566282846173,
 0.8039193976970769,
 0.7573073516386182,
 0.7476380277531738,
 0.7101786241511661,
 0.7283362857986417,
 0.695305580159433,
 0.6761145556539709,
 0.6974092116917625,
 0.6988116327133156,
 0.7184455270150574,
 0.6714275169766755,
 0.6679583702391496,
 0.6658178328904634,
 0.6956746383229995,
 0.6918733392382639,
 0.7025760259816944,
 0.7150501919102448,
 0.7421390611160317,
 0.7370829642751697,
 0.7391127841747858]
```

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0.730255388249188,

```
0.7255683495718925,  
0.739408030705639,  
0.7316947150870978,  
0.710953646294656,  
0.6674047829937997,  
0.6278048420431059,  
0.6360348390906405,  
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0.6378063182757601,  
0.6476970770593444,  
0.6701727192205491,  
0.6679214644227929,  
0.689068497195158,  
0.7216932388544433,  
0.7113227044582224,  
0.6802849129022734,  
0.6942353114850899,  
0.6815766164747563,  
0.6917257159728372,  
0.7037939179214645,  
0.7161942722173014,  
0.7242766459994092,  
0.7215456155890168,  
0.7099202834366696,  
0.6699143785060524,  
0.66640832595217,  
0.6714275169766755,  
0.6811706524948331,  
0.6720549158547386,  
0.6915411868910539,  
0.701653380572778,  
0.7111381753764392,  
0.6946043696486566,  
0.6889577797460877,  
0.6633820490109241,  
0.7255314437555358,  
0.7538382049010923,  
0.769818423383525,  
0.7597431355181574,  
0.7479701801003837,  
0.776203129613227,  
0.7805580159433123,  
0.7778269855329198,  
0.7682683790965454,  
0.7755757307351638,  
0.800893120755831]
```

In [189...]

```
from numpy import array  
  
lst_output=[]  
n_steps=100  
i=0  
while(i<30):  
  
    if(len(temp_input)>100):  
        #print(temp_input)  
        x_input=np.array(temp_input[1:])  
        print("{} day input {}".format(i,x_input))  
        x_input=x_input.reshape(1,-1)  
        x_input = x_input.reshape((1, n_steps, 1))  
        #print(x_input)  
        yhat = model.predict(x_input, verbose=0)  
        lst_output.append(yhat)  
    i+=1
```

Loading [MathJax]/jax/output/CommonHTML/fonts/TeX/fontdata.js mat(i,yhat))

```

        temp_input.extend(yhat[0].tolist())
        temp_input=temp_input[1:]
        #print(temp_input)
        lst_output.extend(yhat.tolist())
        i=i+1
    else:
        x_input = x_input.reshape((1, n_steps,1))
        yhat = model.predict(x_input, verbose=0)
        print(yhat[0])
        temp_input.extend(yhat[0].tolist())
        print(len(temp_input))
        lst_output.extend(yhat.tolist())
        i=i+1

print(lst_output)

[0.7705466]
101
1 day input [0.83779894 0.85588279 0.83901683 0.85603041 0.85448037 0.88038825
 0.89777089 0.89205049 0.87156776 0.8756643 0.89614703 0.88105255
 0.83905373 0.84595512 0.82971656 0.78649985 0.77468999 0.79520963
 0.76645999 0.7690065 0.78664748 0.79055949 0.77007676 0.74505462
 0.76974461 0.7309935 0.77897107 0.80262769 0.75793475 0.78358429
 0.77365663 0.8039194 0.75730735 0.74763803 0.71017862 0.72833629
 0.69530558 0.67611456 0.69740921 0.69881163 0.71844553 0.67142752
 0.66795837 0.66581783 0.69567464 0.69187334 0.70257603 0.71505019
 0.74213906 0.73708296 0.73911278 0.74708444 0.73025539 0.72556835
 0.73940803 0.73169472 0.71095365 0.66740478 0.62780484 0.63603484
 0.66286537 0.63780632 0.64769708 0.67017272 0.66792146 0.6890685
 0.72169324 0.7113227 0.68028491 0.69423531 0.68157662 0.69172572
 0.70379392 0.71619427 0.72427665 0.72154562 0.70992028 0.66991438
 0.66640833 0.67142752 0.68117065 0.67205492 0.69154119 0.70165338
 0.71113818 0.69460437 0.68895778 0.66338205 0.72553144 0.7538382
 0.76981842 0.75974314 0.74797018 0.77620313 0.78055802 0.77782699
 0.76826838 0.77557573 0.80089312 0.77054662]
1 day output [[0.76850706]]
2 day input [0.85588279 0.83901683 0.85603041 0.85448037 0.88038825 0.89777089
 0.89205049 0.87156776 0.8756643 0.89614703 0.88105255 0.83905373
 0.84595512 0.82971656 0.78649985 0.77468999 0.79520963 0.76645999
 0.7690065 0.78664748 0.79055949 0.77007676 0.74505462 0.76974461
 0.7309935 0.77897107 0.80262769 0.75793475 0.78358429 0.77365663
 0.8039194 0.75730735 0.74763803 0.71017862 0.72833629 0.69530558
 0.67611456 0.69740921 0.69881163 0.71844553 0.67142752 0.66795837
 0.66581783 0.69567464 0.69187334 0.70257603 0.71505019 0.74213906
 0.73708296 0.73911278 0.74708444 0.73025539 0.72556835 0.73940803
 0.73169472 0.71095365 0.66740478 0.62780484 0.63603484 0.66286537
 0.63780632 0.64769708 0.67017272 0.66792146 0.6890685 0.72169324
 0.7113227 0.68028491 0.69423531 0.68157662 0.69172572 0.70379392
 0.71619427 0.72427665 0.72154562 0.70992028 0.66991438 0.66640833
 0.67142752 0.68117065 0.67205492 0.69154119 0.70165338 0.71113818
 0.69460437 0.68895778 0.66338205 0.72553144 0.7538382 0.76981842
 0.75974314 0.74797018 0.77620313 0.78055802 0.77782699 0.76826838
 0.77557573 0.80089312 0.77054662 0.76850706]
2 day output [[0.76468015]]
3 day input [0.83901683 0.85603041 0.85448037 0.88038825 0.89777089 0.89205049
 0.87156776 0.8756643 0.89614703 0.88105255 0.83905373 0.84595512
 0.82971656 0.78649985 0.77468999 0.79520963 0.76645999 0.7690065
 0.78664748 0.79055949 0.77007676 0.74505462 0.76974461 0.7309935
 0.77897107 0.80262769 0.75793475 0.78358429 0.77365663 0.8039194
 0.75730735 0.74763803 0.71017862 0.72833629 0.69530558 0.67611456
 0.69740921 0.69881163 0.71844553 0.67142752 0.66795837 0.66581783
 0.73940803 0.73169472 0.71095365 0.66740478 0.62780484 0.63603484
 0.72556835 0.72154562 0.70992028 0.66991438 0.70165338 0.71113818
 0.76981842 0.75974314 0.74797018 0.77620313 0.78055802 0.77782699
 0.76826838 0.77557573 0.80089312 0.77054662 0.76850706]

```

Loading [MathJax]/jax/output/CommonHTML/fonts/TeX/fontdata.js 1505019 0.74213906 0.73708296
0.73911278 0.74708444 0.73025539 0.72556835 0.73940803 0.73169472

```

0.71095365 0.66740478 0.62780484 0.63603484 0.66286537 0.63780632
0.64769708 0.67017272 0.66792146 0.6890685 0.72169324 0.7113227
0.68028491 0.69423531 0.68157662 0.69172572 0.70379392 0.71619427
0.72427665 0.72154562 0.70992028 0.66991438 0.66640833 0.67142752
0.68117065 0.67205492 0.69154119 0.70165338 0.71113818 0.69460437
0.68895778 0.66338205 0.72553144 0.7538382 0.76981842 0.75974314
0.74797018 0.77620313 0.78055802 0.77782699 0.76826838 0.77557573
0.80089312 0.77054662 0.76850706 0.76468015]
3 day output [[0.75953597]]
4 day input [0.85603041 0.85448037 0.88038825 0.89777089 0.89205049 0.87156776
0.8756643 0.89614703 0.88105255 0.83905373 0.84595512 0.82971656
0.78649985 0.77468999 0.79520963 0.76645999 0.7690065 0.78664748
0.79055949 0.77007676 0.74505462 0.76974461 0.7309935 0.77897107
0.80262769 0.75793475 0.78358429 0.77365663 0.8039194 0.75730735
0.74763803 0.71017862 0.72833629 0.69530558 0.67611456 0.69740921
0.69881163 0.71844553 0.67142752 0.66795837 0.66581783 0.69567464
0.69187334 0.70257603 0.71505019 0.74213906 0.73708296 0.73911278
0.74708444 0.73025539 0.72556835 0.73940803 0.73169472 0.71095365
0.66740478 0.62780484 0.63603484 0.66286537 0.63780632 0.64769708
0.67017272 0.66792146 0.6890685 0.72169324 0.71113818 0.68895778
0.66338205 0.72553144 0.7538382 0.76981842 0.75974314 0.74797018
0.77620313 0.78055802 0.77782699 0.76826838 0.77557573 0.80089312
0.77054662 0.76850706 0.76468015 0.75953597]
4 day output [[0.7536369]]
5 day input [0.85448037 0.88038825 0.89777089 0.89205049 0.87156776 0.8756643
0.89614703 0.88105255 0.83905373 0.84595512 0.82971656 0.78649985
0.77468999 0.79520963 0.76645999 0.7690065 0.78664748 0.79055949
0.77007676 0.74505462 0.76974461 0.7309935 0.77897107 0.80262769
0.75793475 0.78358429 0.77365663 0.8039194 0.75730735 0.74763803
0.71017862 0.72833629 0.69530558 0.67611456 0.69740921 0.69881163
0.71844553 0.67142752 0.66795837 0.66581783 0.69567464 0.69187334
0.70257603 0.71505019 0.74213906 0.73708296 0.73911278 0.74708444
0.73025539 0.72556835 0.73940803 0.73169472 0.71095365 0.66740478
0.62780484 0.63603484 0.66286537 0.63780632 0.64769708 0.67017272
0.66792146 0.6890685 0.72169324 0.71113818 0.68028491 0.69423531
0.68157662 0.69172572 0.70379392 0.71619427 0.72427665 0.72154562
0.70992028 0.66991438 0.66640833 0.67142752 0.68117065 0.67205492
0.69154119 0.70165338 0.71113818 0.69460437 0.68895778 0.66338205
0.72553144 0.7538382 0.76981842 0.75974314 0.74797018 0.77620313
0.78055802 0.77782699 0.76826838 0.77557573 0.80089312 0.77054662
0.76850706 0.76468015 0.75953597 0.7536369 ]
5 day output [[0.74747676]]
6 day input [0.88038825 0.89777089 0.89205049 0.87156776 0.8756643 0.89614703
0.88105255 0.83905373 0.84595512 0.82971656 0.78649985 0.77468999
0.79520963 0.76645999 0.7690065 0.78664748 0.79055949 0.77007676
0.74505462 0.76974461 0.7309935 0.77897107 0.80262769 0.75793475
0.78358429 0.77365663 0.8039194 0.75730735 0.74763803 0.71017862
0.72833629 0.69530558 0.67611456 0.69740921 0.69881163 0.71844553
0.67142752 0.66795837 0.66581783 0.69567464 0.69187334 0.70257603
0.71505019 0.74213906 0.73708296 0.73911278 0.74708444 0.73025539
0.72556835 0.73940803 0.73169472 0.71095365 0.66740478 0.62780484
0.63603484 0.66286537 0.63780632 0.64769708 0.67017272 0.66792146
0.6890685 0.72169324 0.71113818 0.68028491 0.69423531 0.68157662
0.69172572 0.70379392 0.71619427 0.72427665 0.72154562 0.70992028
0.66991438 0.66640833 0.67142752 0.68117065 0.67205492 0.69154119
0.70165338 0.71113818 0.69460437 0.68895778 0.66338205 0.72553144
0.7538382 0.76981842 0.75974314 0.74797018 0.77620313 0.78055802
0.77782699 0.76826838 0.77557573 0.80089312 0.77054662 0.76850706
0.76468015 0.75953597 0.7536369 0.74747676]
6 day output [[0.74143511]]

```

Loading [MathJax]/jax/output/CommonHTML/fonts/TeX/fontdata.js 87156776 0.8756643 0.89614703 0.88105255
0.83905373 0.84595512 0.82971656 0.78649985 0.77468999 0.79520963

```

0.76645999 0.7690065 0.78664748 0.79055949 0.77007676 0.74505462
0.76974461 0.7309935 0.77897107 0.80262769 0.75793475 0.78358429
0.77365663 0.8039194 0.75730735 0.74763803 0.71017862 0.72833629
0.69530558 0.67611456 0.69740921 0.69881163 0.71844553 0.67142752
0.66795837 0.66581783 0.69567464 0.69187334 0.70257603 0.71505019
0.74213906 0.73708296 0.73911278 0.74708444 0.73025539 0.72556835
0.73940803 0.73169472 0.71095365 0.66740478 0.62780484 0.63603484
0.66286537 0.63780632 0.64769708 0.67017272 0.66792146 0.6890685
0.72169324 0.7113227 0.68028491 0.69423531 0.68157662 0.69172572
0.70379392 0.71619427 0.72427665 0.72154562 0.70992028 0.66991438
0.66640833 0.67142752 0.68117065 0.67205492 0.69154119 0.70165338
0.71113818 0.69460437 0.68895778 0.66338205 0.72553144 0.7538382
0.76981842 0.75974314 0.74797018 0.77620313 0.78055802 0.77782699
0.76826838 0.77557573 0.80089312 0.77054662 0.76850706 0.76468015
0.75953597 0.7536369 0.74747676 0.74143511]

7 day output [[0.7357854]]
8 day input [0.89205049 0.87156776 0.8756643 0.89614703 0.88105255 0.83905373
0.84595512 0.82971656 0.78649985 0.77468999 0.79520963 0.76645999
0.7690065 0.78664748 0.79055949 0.77007676 0.74505462 0.76974461
0.7309935 0.77897107 0.80262769 0.75793475 0.78358429 0.77365663
0.8039194 0.75730735 0.74763803 0.71017862 0.72833629 0.69530558
0.67611456 0.69740921 0.69881163 0.71844553 0.67142752 0.66795837
0.66581783 0.69567464 0.69187334 0.70257603 0.71505019 0.74213906
0.73708296 0.73911278 0.74708444 0.73025539 0.72556835 0.73940803
0.73169472 0.71095365 0.66740478 0.62780484 0.63603484 0.66286537
0.63780632 0.64769708 0.67017272 0.66792146 0.6890685 0.72169324
0.7113227 0.68028491 0.69423531 0.68157662 0.69172572 0.70379392
0.71619427 0.72427665 0.72154562 0.70992028 0.66991438 0.66640833
0.67142752 0.68117065 0.67205492 0.69154119 0.70165338 0.71113818
0.69460437 0.68895778 0.66338205 0.72553144 0.7538382 0.76981842
0.75974314 0.74797018 0.77620313 0.78055802 0.77782699 0.76826838
0.77557573 0.80089312 0.77054662 0.76850706 0.76468015 0.75953597
0.7536369 0.74747676 0.74143511 0.73578542]

8 day output [[0.7307167]]
9 day input [0.87156776 0.8756643 0.89614703 0.88105255 0.83905373 0.84595512
0.82971656 0.78649985 0.77468999 0.79520963 0.76645999 0.7690065
0.78664748 0.79055949 0.77007676 0.74505462 0.76974461 0.7309935
0.77897107 0.80262769 0.75793475 0.78358429 0.77365663 0.8039194
0.75730735 0.74763803 0.71017862 0.72833629 0.69530558 0.67611456
0.69740921 0.69881163 0.71844553 0.67142752 0.66795837 0.66581783
0.69567464 0.69187334 0.70257603 0.71505019 0.74213906 0.73708296
0.73911278 0.74708444 0.73025539 0.72556835 0.73940803 0.73169472
0.71095365 0.66740478 0.62780484 0.63603484 0.66286537 0.63780632
0.64769708 0.67017272 0.66792146 0.6890685 0.72169324 0.7113227
0.68028491 0.69423531 0.68157662 0.69172572 0.70379392 0.71619427
0.72427665 0.72154562 0.70992028 0.66991438 0.66640833 0.67142752
0.68117065 0.67205492 0.69154119 0.70165338 0.71113818 0.69460437
0.68895778 0.66338205 0.72553144 0.7538382 0.76981842 0.75974314
0.74797018 0.77620313 0.78055802 0.77782699 0.76826838 0.77557573
0.80089312 0.77054662 0.76850706 0.76468015 0.75953597 0.7536369
0.74747676 0.74143511 0.73578542 0.73071671]

9 day output [[0.7263551]]
10 day input [0.8756643 0.89614703 0.88105255 0.83905373 0.84595512 0.82971656
0.78649985 0.77468999 0.79520963 0.76645999 0.7690065 0.78664748
0.79055949 0.77007676 0.74505462 0.76974461 0.7309935 0.77897107
0.80262769 0.75793475 0.78358429 0.77365663 0.8039194 0.75730735
0.74763803 0.71017862 0.72833629 0.69530558 0.67611456 0.69740921
0.69881163 0.71844553 0.67142752 0.66795837 0.66581783 0.69567464
0.69187334 0.70257603 0.71505019 0.74213906 0.73708296 0.73911278
0.74708444 0.73025539 0.72556835 0.73940803 0.73169472 0.71095365
0.66740478 0.62780484 0.63603484 0.66286537 0.63780632 0.64769708
0.67017272 0.66792146 0.6890685 0.72169324 0.7113227 0.68028491
0.69423531 0.68157662 0.69172572 0.70379392 0.71619427 0.72427665]

```

Loading [MathJax]/jax/output/CommonHTML/fonts/TeX/fontdata.js 5640833 0.67142752 0.68117065
0.67205492 0.69154119 0.70165338 0.71113818 0.69460437 0.68895778

```

0.66338205 0.72553144 0.7538382 0.76981842 0.75974314 0.74797018
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0.77054662 0.76850706 0.76468015 0.75953597 0.7536369 0.74747676
0.74143511 0.73578542 0.73071671 0.72635508]
10 day output [[0.72277933]]
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0.77007676 0.74505462 0.76974461 0.7309935 0.77897107 0.80262769
0.75793475 0.78358429 0.77365663 0.8039194 0.75730735 0.74763803
0.71017862 0.72833629 0.69530558 0.67611456 0.69740921 0.69881163
0.71844553 0.67142752 0.66795837 0.66581783 0.69567464 0.69187334
0.70257603 0.71505019 0.74213906 0.73708296 0.73911278 0.74708444
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0.62780484 0.63603484 0.66286537 0.63780632 0.64769708 0.67017272
0.66792146 0.6890685 0.72169324 0.7113227 0.68028491 0.69423531
0.68157662 0.69172572 0.70379392 0.71619427 0.72427665 0.72154562
0.70992028 0.66991438 0.66640833 0.67142752 0.68117065 0.67205492
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0.76850706 0.76468015 0.75953597 0.7536369 0.74747676 0.74143511
0.73578542 0.73071671 0.72635508 0.72277933]
11 day output [[0.72002846]]
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0.67142752 0.66795837 0.66581783 0.69567464 0.69187334 0.70257603
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0.63603484 0.66286537 0.63780632 0.64769708 0.67017272 0.66792146
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0.70165338 0.71113818 0.69460437 0.68895778 0.66338205 0.72553144
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0.76468015 0.75953597 0.7536369 0.74747676 0.74143511 0.73578542
0.73071671 0.72635508 0.72277933 0.72002846]
12 day output [[0.7181099]]
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0.70379392 0.71619427 0.72427665 0.72154562 0.70992028 0.66991438
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0.76826838 0.77557573 0.80089312 0.77054662 0.76850706 0.76468015
0.75953597 0.7536369 0.74747676 0.74143511 0.73578542 0.73071671
0.72635508 0.72277933 0.72002846 0.7181099]
13 day output [[0.71700245]]
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0.69460437 0.68895778 0.66338205 0.72553144 0.7538382 0.76981842
0.75974314 0.74797018 0.77620313 0.78055802 0.77782699 0.76826838
0.77557573 0.80089312 0.77054662 0.76850706 0.76468015 0.75953597
0.7536369 0.74747676 0.74143511 0.73578542 0.73071671 0.72635508
0.72277933 0.72002846 0.71810991 0.71700245] ]
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0.75730735 0.74763803 0.71017862 0.72833629 0.69530558 0.67611456
0.69740921 0.69881163 0.71844553 0.67142752 0.66795837 0.66581783
0.69567464 0.69187334 0.70257603 0.71505019 0.74213906 0.73708296
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0.71095365 0.66740478 0.62780484 0.63603484 0.66286537 0.63780632
0.64769708 0.67017272 0.66792146 0.6890685 0.72169324 0.7113227
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0.68895778 0.66338205 0.72553144 0.7538382 0.76981842 0.75974314
0.74797018 0.77620313 0.78055802 0.77782699 0.76826838 0.77557573
0.80089312 0.77054662 0.76850706 0.76468015 0.75953597 0.7536369
0.74747676 0.74143511 0.73578542 0.73071671 0.72635508 0.72277933
0.72002846 0.71810991 0.71700245 0.71666098] ]
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0.77620313 0.78055802 0.77782699 0.76826838 0.77557573 0.80089312
0.77054662 0.76850706 0.76468015 0.75953597 0.7536369 0.74747676
0.74143511 0.73578542 0.73071671 0.72635508 0.72277933 0.72002846
0.71810991 0.71700245 0.71666098 0.71701992] ]
16 day output [[0.7179966]]
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 0.72556835 0.73940803 0.73169472 0.71095365 0.66740478 0.62780484
 0.63603484 0.66286537 0.63780632 0.64769708 0.67017272 0.66792146
 0.6890685 0.72169324 0.7113227 0.68028491 0.69423531 0.68157662
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 0.70165338 0.71113818 0.69460437 0.68895778 0.66338205 0.72553144
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 0.77782699 0.76826838 0.77557573 0.80089312 0.77054662 0.76850706
 0.76468015 0.75953597 0.7536369 0.74747676 0.74143511 0.73578542
 0.73071671 0.72635508 0.72277933 0.72002846 0.71810991 0.71700245
 0.71666098 0.71701992 0.7179966 0.71949673]

18 day output [[0.7214164]]
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 0.69530558 0.67611456 0.69740921 0.69881163 0.71844553 0.67142752
 0.66795837 0.66581783 0.69567464 0.69187334 0.70257603 0.71505019
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 0.71113818 0.69460437 0.68895778 0.66338205 0.72553144 0.7538382
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 0.76826838 0.77557573 0.80089312 0.77054662 0.76850706 0.76468015
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 0.72635508 0.72277933 0.72002846 0.71810991 0.71700245 0.71666098
 0.71701992 0.7179966 0.71949673 0.72141641]

19 day output [[0.7236472]]
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 0.77557573 0.80089312 0.77054662 0.76850706 0.76468015 0.75953597
 0.7536369 0.74747676 0.74143511 0.73578542 0.73071671 0.72635508
 0.72277933 0.72002846 0.71810991 0.71700245 0.71666098 0.71701992
 0.7179966 0.71949673 0.72141641 0.72364718]

20 day output [[0.72607994]]
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0.72002846 0.71810991 0.71700245 0.71666098 0.71701992 0.7179966
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0.69187334 0.70257603 0.71505019 0.74213906 0.73708296 0.73911278
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0.66740478 0.62780484 0.63603484 0.66286537 0.63780632 0.64769708
0.67017272 0.66792146 0.6890685 0.72169324 0.7113227 0.68028491
0.69423531 0.68157662 0.69172572 0.70379392 0.71619427 0.72427665
0.72154562 0.70992028 0.66991438 0.66640833 0.67142752 0.68895778
0.67205492 0.69154119 0.70165338 0.71113818 0.69460437 0.68895778
0.66338205 0.72553144 0.7538382 0.76981842 0.75974314 0.74797018
0.77620313 0.78055802 0.77782699 0.76826838 0.77557573 0.80089312
0.77054662 0.76850706 0.76468015 0.75953597 0.7536369 0.74747676
0.74143511 0.73578542 0.73071671 0.72635508 0.72277933 0.72002846
0.71810991 0.71700245 0.71666098 0.71701992 0.7179966 0.71949673
0.72141641 0.72364718 0.72607994 0.72860783]

22 day output [[0.73113054]]
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0.71017862 0.72833629 0.69530558 0.67611456 0.69740921 0.69881163
0.71844553 0.67142752 0.66795837 0.66581783 0.69567464 0.69187334
0.70257603 0.71505019 0.74213906 0.73708296 0.73911278 0.74708444
0.73025539 0.72556835 0.73940803 0.73169472 0.71095365 0.66740478
0.62780484 0.63603484 0.66286537 0.63780632 0.64769708 0.67017272
0.66792146 0.6890685 0.72169324 0.7113227 0.68028491 0.69423531
0.68157662 0.69172572 0.70379392 0.71619427 0.72427665 0.72154562
0.70992028 0.66991438 0.66640833 0.67142752 0.68117065 0.67205492
0.69154119 0.70165338 0.71113818 0.69460437 0.68895778 0.66338205
0.72553144 0.7538382 0.76981842 0.75974314 0.74797018 0.77620313
0.78055802 0.77782699 0.76826838 0.77557573 0.80089312 0.77054662
0.76850706 0.76468015 0.75953597 0.7536369 0.74747676 0.74143511
0.73578542 0.73071671 0.72635508 0.72277933 0.72002846 0.71810991
0.71700245 0.71666098 0.71701992 0.7179966 0.71949673 0.72141641
0.72364718 0.72607994 0.72860783 0.73113054]

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0.69172572 0.70379392 0.71619427 0.72427665 0.72154562 0.70992028
0.66991438 0.66640833 0.67142752 0.68117065 0.67205492 0.69154119
0.70165338 0.71113818 0.69460437 0.68895778 0.66338205 0.72553144
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0.77782699 0.76826838 0.77557573 0.80089312 0.77054662 0.76850706
0.76468015 0.75953597 0.7536369 0.74747676 0.74143511 0.73578542
0.73071671 0.72635508 0.72277933 0.72002846 0.71810991 0.71700245
0.71666098 0.71701992 0.7179966 0.71949673 0.72141641 0.72364718
0.72607994 0.72860783 0.73113054 0.73355597]

24 day output [[0.7358039]]
25 day input [0.76974461 0.7309935 0.77897107 0.80262769 0.75793475 0.78358429
0.69881163 0.71017862 0.72833629
0.69530558 0.67611456 0.69740921 0.69881163 0.71844553 0.67142752]
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0.69530558 0.67611456 0.69740921 0.69881163 0.71844553 0.67142752

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0.71113818 0.69460437 0.68895778 0.66338205 0.72553144 0.7538382
0.76981842 0.75974314 0.74797018 0.77620313 0.78055802 0.77782699
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0.71701992 0.7179966 0.71949673 0.72141641 0.72364718 0.72607994
0.72860783 0.73113054 0.73355597 0.7358039 ]]
25 day output [[0.7378068]]
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0.73113054 0.73355597 0.7358039 0.7378068 ]]
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0.68157662 0.69172572 0.70379392 0.71619427 0.72427665 0.72154562
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0.69154119 0.70165338 0.71113818 0.69460437 0.68895778 0.66338205
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0.71700245 0.71666098 0.71701992 0.7179966 0.71949673 0.72141641
0.72364718 0.72607994 0.72860783 0.73113054 0.73355597 0.7358039
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```

In [190...]:
`day_new=np.arange(1,101)
day_pred=np.arange(101,131)`

In [191...]:
`import matplotlib.pyplot as plt`

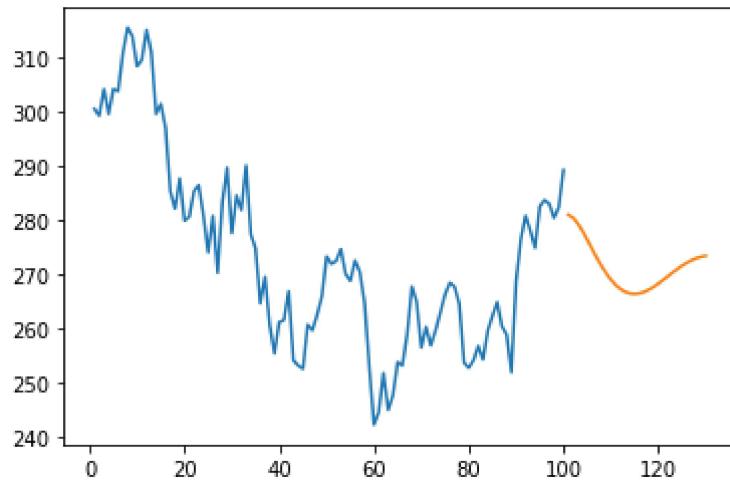
In [193...]:
`len(df1)`

Out[193...]: 1257

Next One Month Prediction

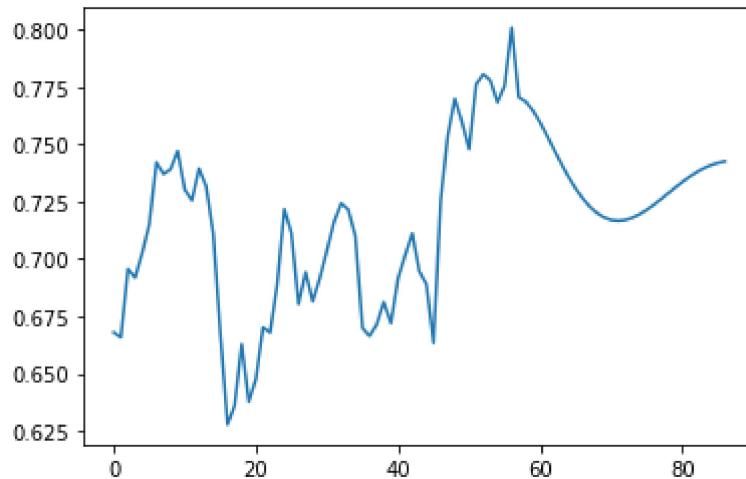
In [194...]:
`plt.plot(day_new,scaler.inverse_transform(df1[1157:]))
plt.plot(day_pred,scaler.inverse_transform(lst_output))`

Out[194...]: [`<matplotlib.lines.Line2D at 0x223675e3160>`]



```
In [198... df3=df1.tolist()  
df3.extend(lst_output)  
plt.plot(df3[1200:]);
```

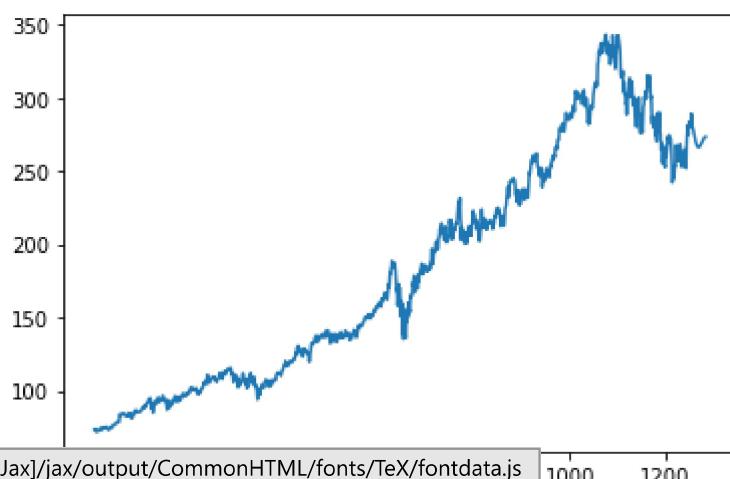
```
Out[198... <matplotlib.lines.Line2D at 0x22367708a90>]
```



```
In [199... df3=scaler.inverse_transform(df3).tolist();
```

```
In [200... plt.plot(df3)
```

```
Out[200... <matplotlib.lines.Line2D at 0x223676ffa60>]
```



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1000 1200

In []:

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