```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from tensorflow.keras import layers,models
```

```
data=pd.read_csv('Google_Stock_Price_Train.csv')
```

```
data.head()
```

	Date	Open	High	Low	Close	Volume
0	01/03/2012	325.25	332.83	324.97	663.59	7,380,500
1	01/04/2012	331.27	333.87	329.08	666.45	5,749,400
2	01/05/2012	329.83	330.75	326.89	657.21	6,590,300
3	01/06/2012	328.34	328.77	323.68	648.24	5,405,900
4	01/09/2012	322.04	322.29	309.46	620.76	11,688,800

Next steps: Generate code with data View recommended plots

```
train_data=data.iloc[:,1:2].values
```

```
train_data.shape
```

```
(1509, 1)
```

```
from sklearn.preprocessing import MinMaxScaler
sc=MinMaxScaler(feature_range=(0,1))
train_scaled=sc.fit_transform(train_data)
```

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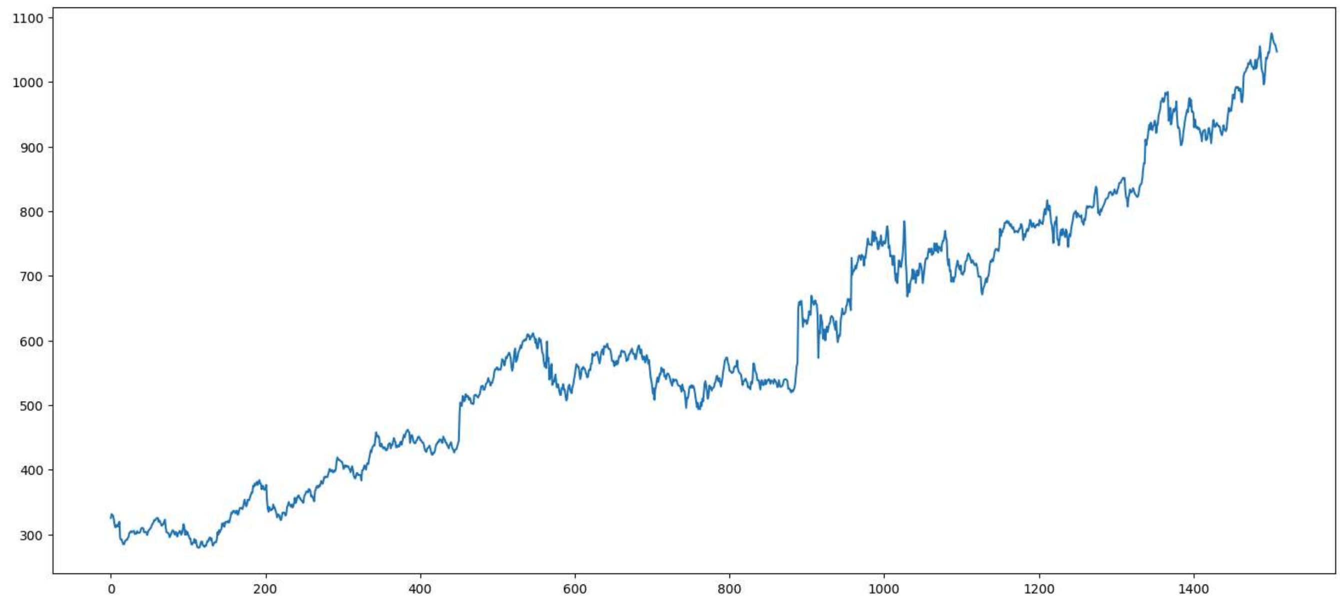
```
x_train=[]
y_train=[]
for i in range(60,len(train_scaled)):
  x_train.append(train_scaled[i-60:i,0])
  y_train.append(train_scaled[i, 0])

x_train,y_train=np.array(x_train),np.array(y_train)
```

```
x_train=np.reshape(x_train,newshape=(x_train.shape[0],x_train.shape[1],1))
```

```
x_train.shape
```

```
(1449, 60, 1)
```

```
plt.figure(figsize=(18,8))
plt.plot(data['Open'])
plt.show()
```




```
model=models.Sequential()
```

```
model.add(layers.LSTM(units=50,return_sequences=True,input_shape=(x_train.shape[1],1)))
model.add(layers.Dropout(rate=0.2))
model.add(layers.LSTM(units=50,return_sequences=True))
model.add(layers.Dropout(rate=0.2))
model.add(layers.LSTM(units=50,return_sequences=True))
model.add(layers.Dropout(rate=0.2))
model.add(layers.LSTM(units=50,return_sequences=False))
model.add(layers.Dropout(rate=0.2))
model.add(layers.Dense(units=1))
```

```
model.summary()
```

```
Model: "sequential_2"
_________________________________________________________________
 Layer (type)                Output Shape              Param #
```

```
=================================================================
 lstm_6 (LSTM)               (None, 60, 50)            10400

 dropout_6 (Dropout)         (None, 60, 50)            0

 lstm_7 (LSTM)               (None, 60, 50)            20200

 dropout_7 (Dropout)         (None, 60, 50)            0

 lstm_8 (LSTM)               (None, 60, 50)            20200

 dropout_8 (Dropout)         (None, 60, 50)            0

 lstm_9 (LSTM)               (None, 50)                20200

 dropout_9 (Dropout)         (None, 50)                0

 dense_2 (Dense)             (None, 1)                 51

=================================================================
Total params: 71051 (277.54 KB)
Trainable params: 71051 (277.54 KB)
Non-trainable params: 0 (0.00 Byte)
_________________________________________________________________
```

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

```
model.fit(x=x_train,y=y_train,epochs=100,batch_size=32)
```

```
Epoch 85/100
46/46 [==============================] - 6s 130ms/step - loss: 8.8448e-04
Epoch 86/100
46/46 [==============================] - 5s 108ms/step - loss: 9.1198e-04
Epoch 87/100
46/46 [==============================] - 5s 118ms/step - loss: 8.9809e-04
Epoch 88/100
46/46 [==============================] - 5s 114ms/step - loss: 8.8070e-04
Epoch 89/100
46/46 [==============================] - 5s 104ms/step - loss: 9.9366e-04
Epoch 90/100
46/46 [==============================] - 6s 127ms/step - loss: 8.8476e-04
Epoch 91/100
46/46 [==============================] - 5s 103ms/step - loss: 8.6136e-04
Epoch 92/100
46/46 [==============================] - 6s 127ms/step - loss: 9.4270e-04
Epoch 93/100
46/46 [==============================] - 5s 105ms/step - loss: 9.8730e-04
Epoch 94/100
46/46 [==============================] - 5s 104ms/step - loss: 9.1906e-04
Epoch 95/100
46/46 [==============================] - 6s 132ms/step - loss: 0.0011
Epoch 96/100
46/46 [==============================] - 5s 104ms/step - loss: 9.4515e-04
Epoch 97/100
46/46 [==============================] - 6s 126ms/step - loss: 9.2408e-04
Epoch 98/100
46/46 [==============================] - 5s 104ms/step - loss: 8.0223e-04
Epoch 99/100
46/46 [==============================] - 5s 107ms/step - loss: 9.0434e-04
Epoch 100/100
46/46 [==============================] - 6s 125ms/step - loss: 9.8358e-04
<keras.src.callbacks.History at 0x7affed7ba9b0>
```

```
test_data=pd.read_csv('Google_Stock_Price_Test.csv')
```

```
test_data.head()
```

	Date	Open	High	Low	Close	Volume
0	02/01/2018	1048.339966	1066.939941	1045.229980	1065.000000	1237600
1	03/01/2018	1064.310059	1086.290039	1063.209961	1082.479980	1430200
2	04/01/2018	1088.000000	1093.569946	1084.001953	1086.400024	1004600
3	05/01/2018	1094.000000	1104.250000	1092.000000	1102.229980	1279100
4	08/01/2018	1102.229980	1111.270020	1101.619995	1106.939941	1047600

Next steps: Generate code with `test_data` View recommended plots

```
real_prices=test_data.iloc[:,1:2].values
```

```
real_prices.shape
```

```
(125, 1)
```

```
total_data=pd.concat((data['Open'],test_data['Open']),axis=0)
inputs=total_data[len(total_data) - len(test_data) - 60:].values
```

```
inputs=inputs.reshape(-1, 1)
inputs=sc.transform(inputs)
```

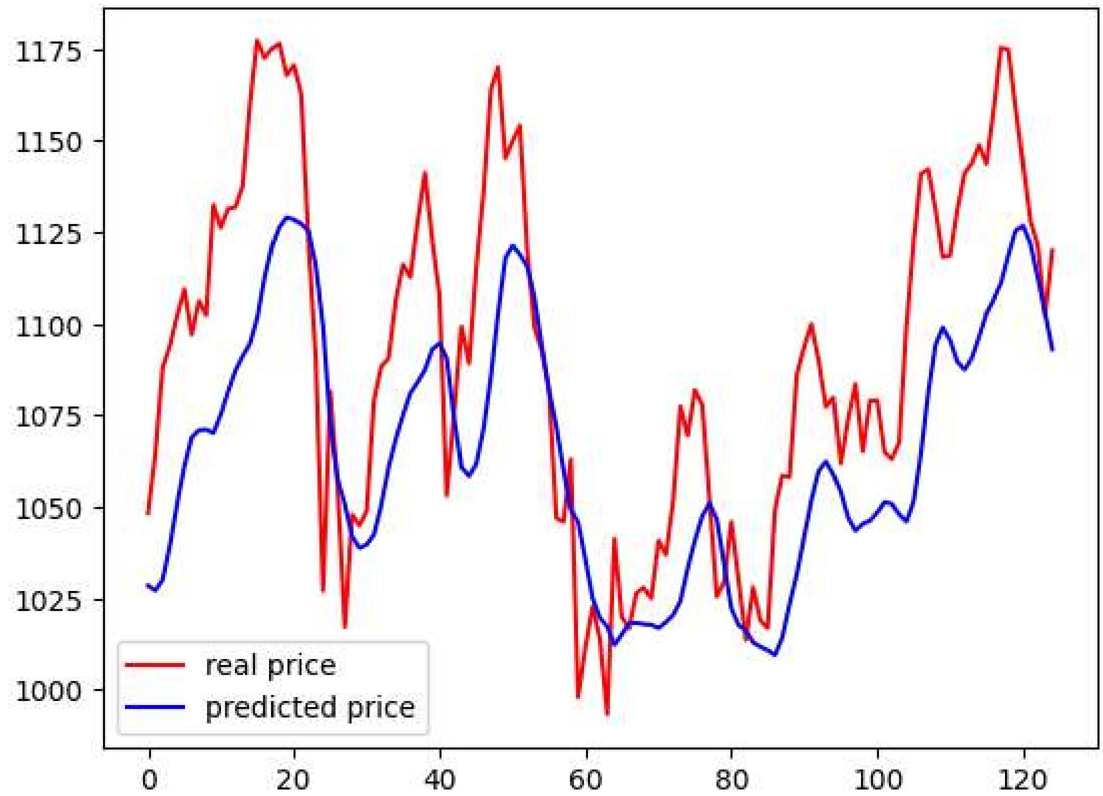
```
x_test=[]
for i in range(60,len(inputs)):
  x_test.append(inputs[i-60:i,0])

x_test=np.array(x_test)
x_test=np.reshape(x_test,newshape=(x_test.shape[0],x_test.shape[1],1))
```

```
predicted_price=model.predict(x_test)
```

```
4/4 [==============================] - 2s 30ms/step
```

```
predicted_price=sc.inverse_transform(predicted_price)
```

```
plt.plot(real_prices, color='red', label='real price')
plt.plot(predicted_price, color='blue', label='predicted price')
# Change the variable name here

plt.legend()
plt.show()
```



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