```
/usr/local/lib/python3.10/dist-packages/pandas/io/common.py in get_handle(path_or_buf, mode, encoding, compression, memory_map, is_text, errors,
           870
                     else:
                        # Binary mode
           871
                         handle = open(handle, ioargs.mode)
        --> 872
                     handles.append(handle)
           873
       FileNotFoundError: [Errno 2] No such file or directory: 'SBIN.NS'
In [ ]: import numpy as np
        import pandas as pd
        import matplotlib.pyplot as plt
        import yfinance as yf
        start = '2012-01-01'
        end = '2022-12-21'
        stock = 'GOOG'
        data = yf.download(stock,start,end)
        [********* 100%********** 1 of 1 completed
In [ ]: data.reset_index(inplace=True)
        data
Out [6]:
                                        High
                                                                   Adj Close
                                                                                Volume
                   Date
                             Open
                                                   Low
                                                            Close
           0 2012-01-03 16.262545 16.641375 16.248346 16.573130 16.554291 147611217
           1 2012-01-04 16.563665 16.693678 16.453827 16.644611 16.625692 114989399
           2 2012-01-05 16.491436 16.537264 16.344486 16.413727 16.395069 131808205
           3 2012-01-06 16.417213 16.438385 16.184088 16.189817 16.171415 108119746
```

 1
 2012-01-04
 16.563665
 16.693678
 16.453827
 16.644611
 16.625692
 114989399

 2
 2012-01-05
 16.491436
 16.537264
 16.344486
 16.413727
 16.395069
 131808205

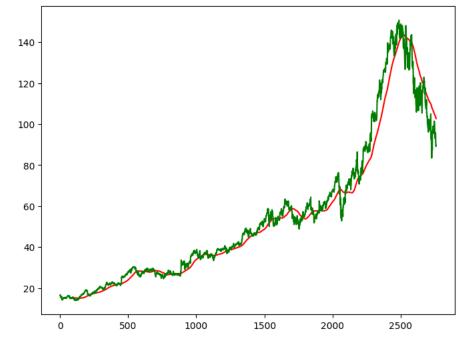
 3
 2012-01-06
 16.417213
 16.438385
 16.184088
 16.189817
 16.171415
 108119746

 4
 2012-01-09
 16.102144
 16.114599
 15.472754
 15.503389
 15.485767
 233776981

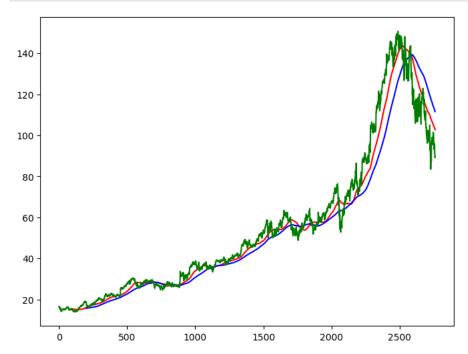
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2761 rows × 7 columns

```
In [ ]: moving_avg_100_days = data.Close.rolling(100).mean()
    plt.figure(figsize=(8,6))
    plt.plot(moving_avg_100_days,'r')
    plt.plot(data.Close,'g')
    plt.show()
```



```
In []: moving_avg_200_days = data.Close.rolling(200).mean()
    plt.figure(figsize=(8,6))
    plt.plot(moving_avg_100_days,'r')
    plt.plot(moving_avg_200_days,'b')
    plt.plot(data.Close,'g')
    plt.show()
```



```
In []: data.dropna(inplace=True)
    data_train = pd.DataFrame(data.Close[0: int(len(data)*0.80)])
    data_test = pd.DataFrame(data.Close[int(len(data)*0.80): len(data)])
```

```
In [ ]: data_train.shape[0]
```

Out [91]: 2208

In [ ]: data\_test.shape[0]

```
Out [92]: 553
 In [ ]: | from sklearn.preprocessing import MinMaxScaler
        scalar = MinMaxScaler(feature_range=(0,1))
 In [ ]:
       data_train_scale = scalar.fit_transform(data_train)
 In [ ]: | x = []
       y = []
        for i in range(100 , data_train_scale.shape[0]):
         x.append(data_train_scale[i-100:i])
         y.append(data_train_scale[i,0])
 In [ ]: \# x, y = np.arry(x), np.array(y)
 In [ ]: # from keras.layers import Dense,Dropout,LSTM
        # from keras.models import Sequential
 In [ ]: x, y = np.array(x) , np.array(y)
        from keras.layers import Dense, Dropout, LSTM
        from keras.models import Sequential
       model = Sequential()
        model.add(LSTM(units = 50 , activation = 'relu' , return_sequences = True , input_shape = ((x.shape[1],1))))
        model.add(Dropout(0.2))
       model.add(LSTM(units = 60 , activation = 'relu' , return_sequences = True))
       model.add(Dropout(0.3))
        model.add(LSTM(units = 80, activation = 'relu' , return_sequences = True))
        model.add(Dropout(0.4))
        model.add(LSTM(units = 120 , activation= 'relu'))
        model.add(Dropout(0.5))
       model.add(Dense(units=1))
       /usr/local/lib/python3.10/dist-packages/keras/src/layers/rnn/rnn.py:204: UserWarning: Do not pass an `input_shape`/`input_dim` argument to a layer. When using Sequential models, prefer using an `Input(shape)` object as the first layer in the model instead.
         super().__init__(**kwargs)
 In [ ]: | model.compile(optimizer='adam' , loss = 'mean_squared_error')
 In [ ]:
       model.fit(x,y, epochs= 50 , batch_size= 32 , verbose= 1)
       Epoch 1/50
       □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m25s□[0m 268ms/step - loss: 0.0610
       Epoch 2/50
       Epoch 3/50
       □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m18s□[0m 257ms/step - loss: 0.0056
       Epoch 4/50
       Epoch 5/50
       Epoch 6/50
       <code>□[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m17s□[0m 257ms/step - loss: 0.0056]]]</code>
       Epoch 7/50
       □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m21s□[0m 264ms/step - loss: 0.0051
       Epoch 8/50
       Epoch 9/50
       Epoch 10/50
       Epoch 11/50
       Epoch 12/50
       □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m19s□[0m 262ms/step - loss: 0.0036
       Epoch 13/50
       Epoch 14/50
```

```
Epoch 15/50
                       <code>□[1m66/660[0m □[32m□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m20s□[0m 278ms/step - loss: 0.0037</code>
                       Epoch 16/50
                       Epoch 17/50
                       <code>□[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m22s□[0m 280ms/step - loss: 0.0033]]]</code>
                       Epoch 18/50
                      □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m19s□[0m 263ms/step - loss: 0.0034
                       Epoch 19/50
                      □[1m66/660[0m □[32m□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m22s□[0m 280ms/step - loss: 0.0036
                      Epoch 20/50
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                       Epoch 21/50
                      □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m17s□[0m 261ms/step - loss: 0.0037
                      Epoch 22/50
                       | 0.0100 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0.0120 | 0
                       Epoch 23/50
                       □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m21s□[0m 274ms/step - loss: 0.0049
                       Epoch 24/50
                      □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m20s□[0m 261ms/step - loss: 0.0035
                       Epoch 25/50
                      Epoch 26/50
                      \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] \[ \] 
                       Epoch 27/50
                      □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m20s□[0m 285ms/step - loss: 0.0032
                       Epoch 28/50
                       Epoch 29/50
                       □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m19s□[0m 261ms/step - loss: 0.0027
                       Epoch 30/50
                      \[ \prootember \] \[ \prootemb
                       Epoch 31/50
                      □[1m66/660[0m □[32m□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m17s□[0m 262ms/step - loss: 0.0027
                      Epoch 32/50
                      □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m21s□[0m 276ms/step - loss: 0.0025
                       Epoch 33/50
                      □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m20s□[0m 264ms/step - loss: 0.0034
                       Epoch 34/50
                       Epoch 35/50
                       □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m19s□[0m 264ms/step - loss: 0.0029
                       Epoch 36/50
                      □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m22s□[0m 288ms/step - loss: 0.0024
                       Epoch 37/50
                      □[1m66/660[0m □[32m□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m19s□[0m 259ms/step - loss: 0.0024
                      Epoch 38/50
                      □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m22s□[0m 286ms/step - loss: 0.0030
                       Epoch 39/50
                      □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m21s□[0m 288ms/step - loss: 0.0025
                       Epoch 40/50
                       Epoch 41/50
                       Epoch 42/50
                      □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m20s□[0m 263ms/step - loss: 0.0022
                       Epoch 43/50
                      □[1m66/660[0m □[32m□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m19s□[0m 290ms/step - loss: 0.0024
                      Epoch 44/50
                      □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m19s□[0m 263ms/step - loss: 0.0024
                       Epoch 45/50
                      □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m22s□[0m 284ms/step - loss: 0.0023
                      Epoch 46/50
                       Epoch 47/50
                       □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m22s□[0m 279ms/step - loss: 0.0025
                       Epoch 48/50
                      □[1m66/66□[0m □[32m□□□□□□□□□□□□□□□□□□□□□□[0m□[37m□[0m □[1m19s□[0m 260ms/step - loss: 0.0022
                       Epoch 49/50
                       Epoch 50/50
                      Out [98]: <keras.src.callbacks.history.History at 0x7dd49e565ea0>
```

In [ ]: model.summary()

Model: "sequential\_8"

Layer (type)	Output Shape	Param #
lstm_19 (LSTM)	(None, 100, 50)	10,400
dropout_16 (Dropout)	(None, 100, 50)	0
1stm_20 (LSTM)	(None, 100, 60)	26,640
dropout_17 (Dropout)	(None, 100, 60)	0
1stm_21 (LSTM)	(None, 100, 80)	45,120   
dropout_18 (Dropout)	(None, 100, 80)	0
1stm_22 (LSTM)	(None, 120)	96,480

```
dropout_19 (Dropout)
                                              (None, 120)
                                                                                           0
                                              (None, 1)
                                                                                         121
          dense_4 (Dense)
         Total params: 536,285 (2.05 MB)
         Trainable params: 178,761 (698.29 KB)
         Non-trainable params: 0 (0.00 B)
         Optimizer params: 357,524 (1.36 MB)
  In [ ]: # pas_100_days = data_train.tail(100)
  In [ ]: | # data_test = pd.concat([pas_100_days, data_test], ignore_index= True)
         # data_test
         # data_test_scale = scalar.fit_transform(data_test)
  In [ ]: pas_100_days = data_train.tail(100)
         data_test = pd.concat([pas_100_days, data_test], ignore_index= True)
         data_test_scale = scalar.fit_transform(data_test)
         x = []
         y = []
         for i in range(100 , data_test_scale.shape[0]):
           x.append(data_test_scale[i-100:i])
           y.append(data_test_scale[i,0])
         x, y = np.array(x), np.array(y)
  In [ ]: y_predict = model.predict(x)
        In [ ]: scalar.scale_
Out [102]: array([0.01208985])
  In [ ]: scale = 1/scalar.scale_
  In [ ]:
        y_predict = y_predict*scale
  In [ ]:
        y = y*scale
  In [ ]: plt.figure(figsize=(10,8))
         plt.plot(y_predict, 'r', label = 'predicted Price')
         plt.plot(y,'g',label = 'Original Price')
         plt.xlabel('Time')
         plt.ylabel('Price')
         plt.legend()
         plt.show()
```

