In [ ]:
```
from google.colab import drive
drive.mount('/content/drive')
```

```
Mounted at /content/drive
```

In [ ]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
```

In [ ]:
```
training_set=pd.read_csv('/content/drive/MyDrive/deep_learning_dataset/google_stock/google_train.csv')
training_set
```

Out[8]:

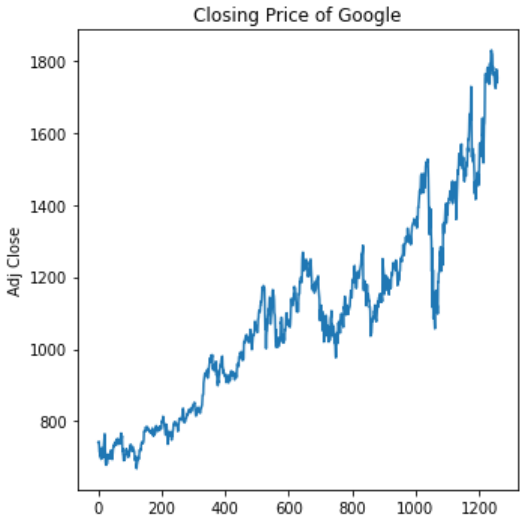
	Date	Open	High	Low	Close	Adj Close	Volume
0	1/4/2016	743.000000	744.059998	731.257996	741.840027	741.840027	3272800
1	1/5/2016	746.450012	752.000000	738.640015	742.580017	742.580017	1950700
2	1/6/2016	730.000000	747.179993	728.919983	743.619995	743.619995	1947000
3	1/7/2016	730.309998	738.500000	719.059998	726.390015	726.390015	2963700
4	1/8/2016	731.450012	733.229980	713.000000	714.469971	714.469971	2450900
...	...	...	...	...	...	...	...
1254	12/24/2020	1735.000000	1746.000000	1729.109985	1738.849976	1738.849976	346800
1255	12/28/2020	1751.635010	1790.728027	1746.334961	1776.089966	1776.089966	1393000
1256	12/29/2020	1787.790039	1792.439941	1756.089966	1758.719971	1758.719971	1299400
1257	12/30/2020	1762.010010	1765.094971	1725.599976	1739.520020	1739.520020	1306100
1258	12/31/2020	1735.420044	1758.930054	1735.420044	1751.880005	1751.880005	1011900

1259 rows × 7 columns

In [ ]:
```
training_set.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1259 entries, 0 to 1258
Data columns (total 7 columns):
 #   Column     Non-Null Count  Dtype  
---  ------     --------------  -----  
 0   Date       1259 non-null   object 
 1   Open       1259 non-null   float64
 2   High       1259 non-null   float64
 3   Low        1259 non-null   float64
 4   Close      1259 non-null   float64
 5   Adj Close  1259 non-null   float64
 6   Volume     1259 non-null   int64  
dtypes: float64(5), int64(1), object(1)
memory usage: 69.0+ KB
```

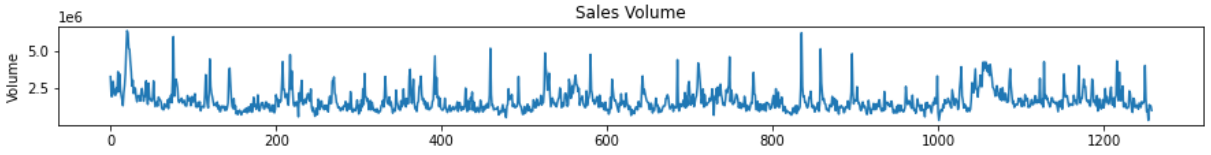
In [ ]:
```
import matplotlib.pyplot as plt
plt.figure(figsize=(5, 5))
plt.subplots_adjust(top=1.25, bottom=1.2)
training_set['Adj Close'].plot()
plt.ylabel('Adj Close')
plt.xlabel(None)
plt.title(f"Closing Price of Google")
plt.tight_layout()
```



In [ ]:
```
```

In [ ]:
```
# Now let's plot the total volume of stock being traded each day
plt.figure(figsize=(15, 20))
plt.subplots_adjust(top=1.25, bottom=1.2)
training_set['Volume'].plot()
plt.ylabel('Volume')
plt.xlabel(None)
plt.title(f"Sales Volume")
```

Out[25]:
```
Text(0.5, 1.0, 'Sales Volume')
```



In [ ]:
```
training_set=training_set.iloc[:,1:2].values
```

In [ ]:
```
from sklearn.preprocessing import MinMaxScaler
sc= MinMaxScaler()
training_set=sc.fit_transform(training_set)

X_train= training_set[0:1257]
y_train= training_set[1:1258]

X_train=np.reshape(X_train, (1257 , 1 , 1))
```

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

In [ ]:
```
regressor = Sequential()

regressor.add(LSTM(units=4, activation= 'sigmoid', input_shape= (None,1)))

regressor.add(Dense( units=1 ))

regressor.compile(optimizer='adam', loss='mean_squared_error')
regressor.fit(X_train, y_train, batch_size=32, epochs=200)
```

```
Epoch 35/200
40/40 [==============================] - 0s 1ms/step - loss: 0.0125
Epoch 36/200
40/40 [==============================] - 0s 1ms/step - loss: 0.0115
Epoch 37/200
40/40 [==============================] - 0s 2ms/step - loss: 0.0106
Epoch 38/200
40/40 [==============================] - 0s 1ms/step - loss: 0.0097
Epoch 39/200
40/40 [==============================] - 0s 2ms/step - loss: 0.0088
Epoch 40/200
40/40 [==============================] - 0s 1ms/step - loss: 0.0080
Epoch 41/200
40/40 [==============================] - 0s 2ms/step - loss: 0.0072
Epoch 42/200
40/40 [==============================] - 0s 1ms/step - loss: 0.0065
Epoch 43/200
40/40 [==============================] - 0s 2ms/step - loss: 0.0058
Epoch 44/200
40/40 [==============================] - 0s 1ms/step - loss: 0.0052
```

In [ ]:
```
test_set = pd.read_csv('/content/drive/MyDrive/deep_learning_dataset/google_stock/google_test.csv')
real_stock_price = test_set.iloc[:,1:2].values

inputs = real_stock_price
inputs = sc.transform(inputs)
inputs = np.reshape(inputs, (20 , 1, 1))
predicted_stock_price = regressor.predict(inputs)
predicted_stock_price = sc.inverse_transform(predicted_stock_price)
```

```
1/1 [==============================] - 0s 141ms/step
```

In [ ]:
```
plt.plot( real_stock_price , color = 'red' , label = 'Real Google Stock Price')
plt.plot( predicted_stock_price , color = 'blue' , label = 'Predicted Google Stock Price')
plt.title('Google Stock Price Prediction')
plt.xlabel( 'time' )
plt.ylabel( 'Google Stock Price' )
plt.legend()
plt.show()
```