

IMPORTING MODEL BUILDING LIBRARIES

```
import numpy as np
from keras.models import Sequential
from keras.layers import LSTM
from keras.layers import Dropout
from keras.layers import Dense
import pandas as pd
from matplotlib import pyplot as plt
from sklearn.preprocessing import StandardScaler
from sklearn.metrics import mean_absolute_error as mae
from sklearn.metrics import mean_squared_error as mse
from sklearn.metrics import r2_score as r2s
from google.colab import files
from math import sqrt
```

INITIALIZING THE MODEL

```
def plotCurve(x,y,xlable,ylabel,clabel):
    fig, ax = plt.subplots(figsize=(5, 3))
    fig.subplots_adjust(bottom=0.15, left=0.2)
    ax.plot(x,y,label=clabel)
    ax.set_xlabel(xlable)
    ax.set_ylabel(ylabel)
    plt.grid()
    ax.legend()
    plt.show()

def plotTwoCurves(x1,x2,y1,y2,xlable,ylabel,clabel1,clabel2):
    fig, ax = plt.subplots(figsize=(5, 3))
    fig.subplots_adjust(bottom=0.15, left=0.2)
    ax.plot(x1,y1,color='blue',label=clabel1)
    ax.plot(x2,y2,color='red',label=clabel2)
    ax.set_xlabel(xlable)
    ax.set_ylabel(ylabel)
    plt.legend()
    plt.show()
```

In [25]:

```
ds=pd.read_csv('Crude_Oil_Prices.csv')
ds=ds.set_index(ds['Date'])
ds=ds.dropna()
print(ds)
ds['Date']=pd.to_datetime(ds['Date'])
print(ds['Value'].head())
index1=ds['Date']
```

In [26]:

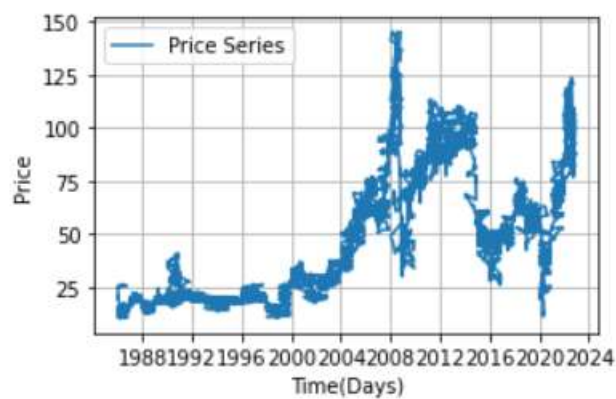
| | Date | Value |
|------------|------------|-------|
| Date | | |
| 02-01-1986 | 02-01-1986 | 25.56 |
| 03-01-1986 | 03-01-1986 | 26.00 |
| 06-01-1986 | 06-01-1986 | 26.53 |
| 07-01-1986 | 07-01-1986 | 25.85 |
| 08-01-1986 | 08-01-1986 | 25.87 |
| ... | ... | ... |
| 20-10-2022 | 20-10-2022 | 85.98 |
| 21-10-2022 | 21-10-2022 | 85.05 |
| 24-10-2022 | 24-10-2022 | 84.92 |
| 25-10-2022 | 25-10-2022 | 84.79 |
| 26-10-2022 | 26-10-2022 | 88.05 |

[9294 rows x 2 columns]

| Date | |
|------------|-------|
| 02-01-1986 | 25.56 |
| 03-01-1986 | 26.00 |
| 06-01-1986 | 26.53 |
| 07-01-1986 | 25.85 |
| 08-01-1986 | 25.87 |

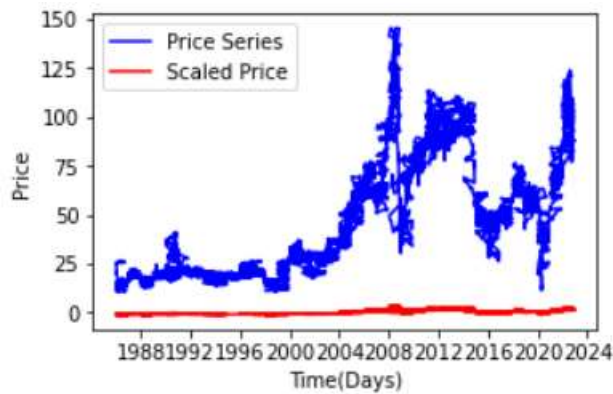
Name: Value, dtype: float64

```
plotCurve(index1,ds['Value'],'Time(Days)','Price','Price Series')
```



```
ds_price=ds['Value'].astype(float)
scaler=StandardScaler()
scaler=scaler.fit(ds_price.values.reshape(-1, 1))
ds_price_scaled=scaler.transform(ds_price.values.reshape(-1, 1))
ds_price_scaled
array([[ -0.68979433],
       [ -0.67488539],
       [ -0.65692689],
       ...,
       [  1.32155776],
       [  1.31715284],
       [  1.42761456]])
```

```
plotTwoCurves(index1,index1,ds['Value'],ds_price_scaled,'Time(Days)','Price
','Price Series','Scaled Price')
```



CREATING TRAINING AND TESTING DATA

```
oilPX=[]
oilPY=[]
predicted_data=0
actual_data=0
next_period=1
window_size=14
```

In [31]:

```
for i in range(window_size, len(ds_price_scaled)-next_period+1):
    oilPX.append(ds_price_scaled[i-window_size:i])
    oilPY.append(ds_price_scaled[i+next_period-1:i+next_period,0])
```

In [32]:

```
oilPX,oilPY=np.array(oilPX),np.array(oilPY)
```

In [33]:

```
print('shape= {}'.format(ds.shape))
print('Price Scaled shape= {}'.format(ds_price_scaled.shape))
print('oilPX shape== {}'.format(oilPX.shape))
print('oilPY shape== {}'.format(oilPY.shape))

shape= (9294, 2).
Price Scaled shape= (9294, 1).
oilPX shape== (9280, 14, 1).
oilPY shape== (9280, 1).
```