

DATA PREPROCESSING

Import The Libraries

```
In [1]: import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

Importing the dataset

```
In [2]: dv=pd.read_csv("Crude Oil Prices Daily.csv")
```

```
In [3]: dv.head()
```

Handling Missing Data

```
In [4]: dv.isnull().any()
```

```
Out[4]: Date                False
Closing Value             True
dtype: bool
```

```
In [5]: dv.isnull().sum()
```

```
Out[5]: Date                0
Closing Value             7
dtype: int64
```

```
In [6]: dv.dropna(axis=0,inplace=True)
```

```
In [7]: dv.isnull().sum()
```

```
Out[7]: Date                0
Closing Value             0
dtype: int64
```

```
In [9]: dv_oil=dv.reset_index()['Closing Value']
```

```
In [10]: dv_oil
```

```
Out[10]: 0      25.56
1      26.00
2      26.53
3      25.85
4      25.87
```

```
...
8211    73.89
8212    74.19
8213    73.05
8214    73.78
8215    73.93
Name: Closing Value, Length: 8216, dtype: float64
```

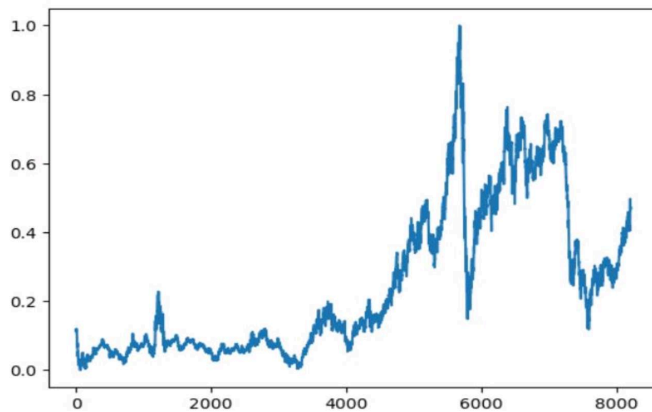
Feature Scaling

```
In [13]: from sklearn.preprocessing import MinMaxScaler
scaler=MinMaxScaler(feature_range=(0,1))
dv_oil=scaler.fit_transform(np.array(dv_oil).reshape(-1,1))
```

Data Visualization

```
In [14]: plt.plot(dv_oil)
```

```
Out[14]: []
```



Splitting Data Into Train And Test

```
In [15]: training_size=int(len(dv_oil)*0.65)
test_size=len(dv_oil)-training_size
train_data,test_data=dv_oil[0:training_size:],dv_oil[training_size:len(dv_oil),:1]
```

```
In [16]: training_size,test_size
```

```
Out[16]: (5340, 2876)
```

```
In [17]: train_data.shape
```

```
Out[17]: (5340, 1)
```

Creating A Dataset With Sliding Windows

```
In [18]: def create_dataset(dataset, time_step=1):
dataX, dataY = [], []
for i in range(len(dataset)-time_step-1):
    a = dataset[i:(i+time_step),0]
    dataX.append(a)
    dataY.append(dataset[i + time_step,0])
return np.array(dataX), np.array(dataY)
```

```
In [19]: time_step = 10
X_train, y_train = create_dataset(train_data, time_step)
X_test, y_test = create_dataset(test_data, time_step)
```

```
In [20]: print(X_train.shape), print(y_train.shape)
```

```
(5329, 10)
(5329,)
```

```
Out[20]: (None, None)
```

```
In [21]: print(X_test.shape), print(y_test.shape)
```

```
(2865, 10)
(2865,)
```

```
Out[21]: (None, None)
```

```
In [22]: X_train
```

```
Out[22]: array([[0.11335703, 0.11661484, 0.12053902, ..., 0.10980305, 0.1089886 ,
                  0.11054346],
                [0.11661484, 0.12053902, 0.11550422, ..., 0.1089886 , 0.11054346,
                  0.10165852],
                [0.12053902, 0.11550422, 0.1156523 , ..., 0.11054346, 0.10165852,
                  0.09906708],
                ...,
                [0.36731823, 0.35176958, 0.36080261, ..., 0.36391234, 0.37042796,
                  0.37042796],
                [0.35176958, 0.36080261, 0.35354657, ..., 0.37042796, 0.37042796,
                  0.37879461],
                [0.36080261, 0.35354657, 0.35295424, ..., 0.37042796, 0.37879461,
                  0.37916482]])
```