```
!pip install pandas-datareader
!pip install yfinance
```

Requirement already satisfied: pandas-datareader in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (0.10.0)

WARNING: You are using pip version 21.2.4; however, version 21.3.1 is available.
You should consider upgrading via the
'c:\users\hp\appdata\local\programs\python\python36\python.exe -m pip install --upgrade
pip' command.

Requirement already satisfied: requests>=2.19.0 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from pandas-
datareader) (2.26.0)
Requirement already satisfied: pandas>=0.23 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from pandas-
datareader) (1.1.5)
Requirement already satisfied: lxml in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from pandas-
datareader) (4.6.5)
Requirement already satisfied: pytz>=2017.2 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from
pandas>=0.23->pandas-datareader) (2021.3)
Requirement already satisfied: numpy>=1.15.4 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from
pandas>=0.23->pandas-datareader) (1.19.5)
Requirement already satisfied: python-dateutil>=2.7.3 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from
pandas>=0.23->pandas-datareader) (2.8.2)
Requirement already satisfied: six>=1.5 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from python-
dateutil>=2.7.3->pandas>=0.23->pandas-datareader) (1.16.0)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from
requests>=2.19.0->pandas-datareader) (1.26.7)
Requirement already satisfied: idna<4,>=2.5 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from
requests>=2.19.0->pandas-datareader) (3.2)
Requirement already satisfied: charset-normalizer~=2.0.0 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from
requests>=2.19.0->pandas-datareader) (2.0.6)
Requirement already satisfied: certifi>=2017.4.17 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from
requests>=2.19.0->pandas-datareader) (2021.5.30)
```

Requirement already satisfied: yfinance in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (0.1.67)
Requirement already satisfied: multitasking>=0.0.7 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from yfinance)
(0.0.10)
Requirement already satisfied: lxml>=4.5.1 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from yfinance)
(4.6.5)
Requirement already satisfied: pandas>=0.24 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from yfinance)
(1.1.5)
Requirement already satisfied: numpy>=1.15 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from yfinance)
(1.19.5)
Requirement already satisfied: requests>=2.20 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from yfinance)
(2.26.0)
Requirement already satisfied: python-dateutil>=2.7.3 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from
pandas>=0.24->yfinance) (2.8.2)
Requirement already satisfied: pytz>=2017.2 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from
pandas>=0.24->yfinance) (2021.3)
Requirement already satisfied: six>=1.5 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from python-
dateutil>=2.7.3->pandas>=0.24->yfinance) (1.16.0)
Requirement already satisfied: certifi>=2017.4.17 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from
requests>=2.20->yfinance) (2021.5.30)
Requirement already satisfied: urllib3<1.27,>=1.21.1 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from
requests>=2.20->yfinance) (1.26.7)
Requirement already satisfied: idna<4,>=2.5 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from
requests>=2.20->yfinance) (3.2)
Requirement already satisfied: charset-normalizer~=2.0.0 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from
requests>=2.20->yfinance) (2.0.6)

WARNING: You are using pip version 21.2.4; however, version 21.3.1 is available.
You should consider upgrading via the
'c:\users\hp\appdata\local\programs\python\python36\python.exe -m pip install --upgrade
pip' command.

```python
import pandas_datareader.data as web
import datetime
import matplotlib.pyplot as plt
import numpy as np
%matplotlib inline
```

```python
start = datetime.datetime(2012,1,1)
end= datetime.datetime(2021,11,30)
```

```python
tatasteel = web.DataReader("TATASTEEL.NS",'yahoo',start,end)
jindalsteel = web.DataReader("JINDALSTEL.NS",'yahoo',start,end)
jswsteel = web.DataReader("JSWSTEEL.NS",'yahoo',start,end)
hindalco = web.DataReader("HINDALCO.NS",'yahoo',start,end)
```

```python
tatasteel.to_csv('TataSteel_stock.csv')
jindalsteel.to_csv('JindalSteel_stock.csv')
jswsteel.to_csv('JSWSteel_stock.csv')
hindalco.to_csv('Hindalco_stock.csv')
```

```python
tatasteel.head()
```

Date	High	Low	Open	Close	Volume	Adj Close
2012-01-02	329.646881	316.403839	321.929718	324.978455	4036645.0	255.693100
2012-01-03	346.605591	327.931946	328.694153	344.747742	6112021.0	271.247559
2012-01-04	350.130707	339.460052	346.796143	346.748505	5721689.0	272.821747
2012-01-05	353.941650	342.413544	347.748871	345.462311	4381464.0	271.809784
2012-01-06	350.416534	333.648376	342.032440	346.462677	4779047.0	272.596893

```python
jindalsteel.head()
```

Date	High	Low	Open	Close	Volume	Adj Close
2012-01-02	464.000000	442.200012	454.200012	460.549988	1507558.0	455.179138
2012-01-03	493.399994	463.000000	463.500000	486.799988	2357829.0	481.123016
2012-01-04	494.799988	472.600006	485.950012	477.049988	1976173.0	471.486725
2012-01-05	485.500000	475.149994	478.399994	481.649994	979963.0	476.033081
2012-01-06	479.450012	461.649994	476.100006	466.250000	1129321.0	460.812683

```python
tatasteel['Open'].plot(label='TataSteel',figsize = (15,7))
jindalsteel['Open'].plot(label ='jindalSteel', figsize = (15,7))
jswsteel['Open'].plot(label='JswSteel',figsize =(15,7))
hindalco['Open'].plot(label = 'Hindalco',figsize =(15,7))
plt.ylabel('StockPrice')
```

```
plt.title('Stock Prices of TataSteel, JindalSteel,JSWSteel and Hindalco')
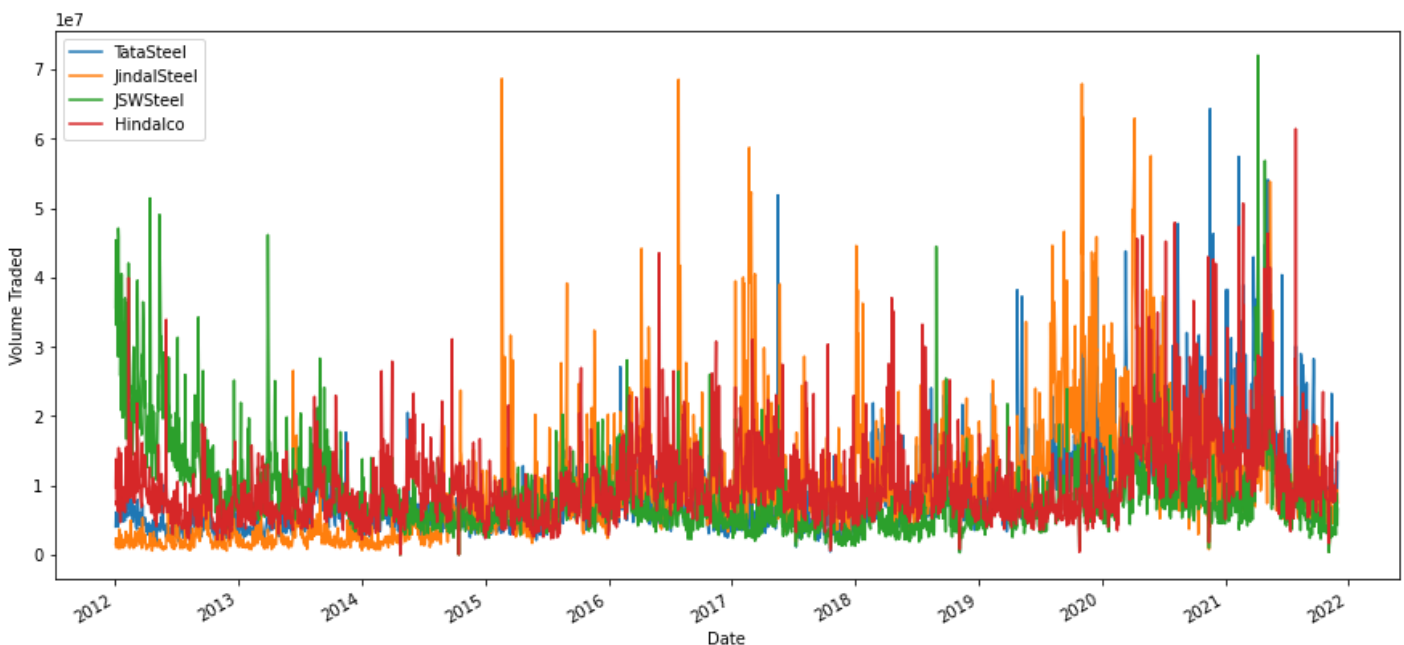
plt.legend()
```

<matplotlib.legend.Legend at 0x1e5f4e8f8d0>
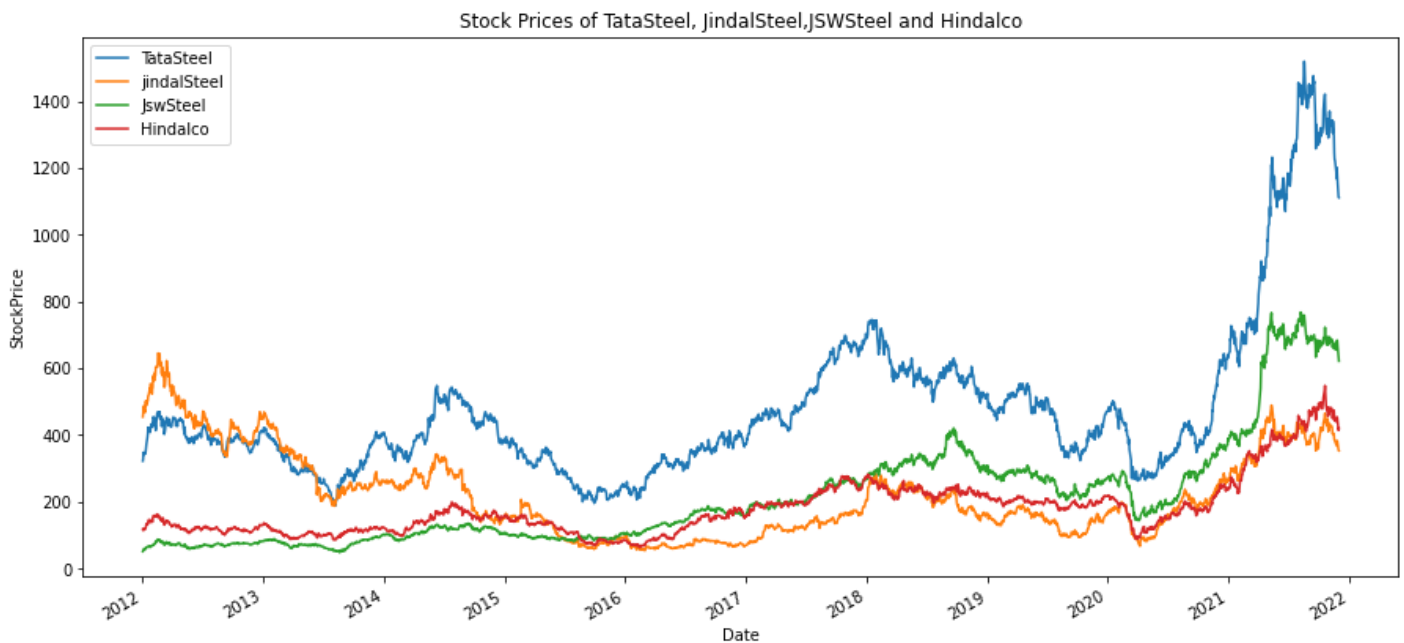

```
tatasteel['Volume'].plot(label='TataSteel',figsize = (15,7))
jindalsteel['Volume'].plot(label='JindalSteel', figsize =(15,7))
jswsteel['Volume'].plot(label='JSWSteel',figsize = (15,7))
hindalco['Volume'].plot(label='Hindalco',figsize = (15,7))
plt.ylabel('Volume Traded')
plt.legend()
```

<matplotlib.legend.Legend at 0x1e5f4e91c18>


```
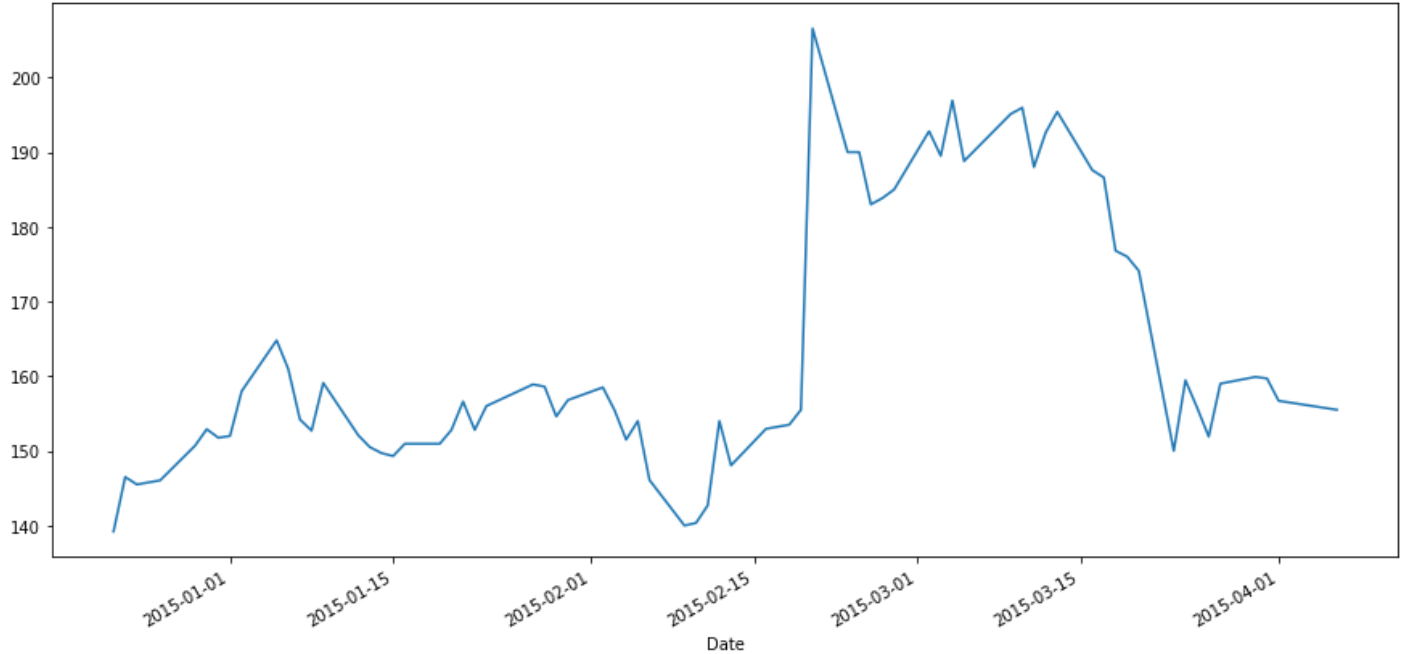jindalsteel.iloc[[jindalsteel['Volume'].argmax()]]
```

	High	Low	Open	Close	Volume	Adj Close
Date						

	High	Low	Open	Close	Volume	Adj Close
Date						
2015-02-19	200.5	153.699997	155.5	195.350006	68648559.0	195.350006

```python
jindalsteel.iloc[730:800]['Open'].plot(figsize=(15,7))
```

<AxesSubplot:xlabel='Date'>


```python
tatasteel['Total Traded'] = tatasteel['Open'] * tatasteel['Volume']
jindalsteel['Total Traded'] = jindalsteel['Open'] * jindalsteel['Volume']
jswsteel['Total Traded'] = jswsteel['Open'] * jswsteel['Volume']
hindalco['Total Traded'] = hindalco['Open'] * hindalco['Volume']
```

```python
tatasteel.head()
```

	High	Low	Open	Close	Volume	Adj Close	Total Traded
Date							
2012-01-02	329.646881	316.403839	321.929718	324.978455	4036645.0	255.693100	1.299516e+09
2012-01-03	346.605591	327.931946	328.694153	344.747742	6112021.0	271.247559	2.008986e+09
2012-01-04	350.130707	339.460052	346.796143	346.748505	5721689.0	272.821747	1.984260e+09
2012-01-05	353.941650	342.413544	347.748871	345.462311	4381464.0	271.809784	1.523649e+09
2012-01-06	350.416534	333.648376	342.032440	346.462677	4779047.0	272.596893	1.634589e+09

```python
jindalsteel.head()
```

	High	Low	Open	Close	Volume	Adj Close	Total Traded
Date							
2012-01-02	464.000000	442.200012	454.200012	460.549988	1507558.0	455.179138	6.847329e+08
2012-01-03	493.399994	463.000000	463.500000	486.799988	2357829.0	481.123016	1.092854e+09

Date	High	Low	Open	Close	Volume	Adj Close	Total Traded
2012-01-04	494.799988	472.600006	485.950012	477.049988	1976173.0	471.486725	9.603213e+08
2012-01-05	485.500000	475.149994	478.399994	481.649994	979963.0	476.033081	4.688143e+08
2012-01-06	479.450012	461.649994	476.100006	466.250000	1129321.0	460.812683	5.376697e+08

```
jswsteel.head()
```

Date	High	Low	Open	Close	Volume	Adj Close	Total Traded
2012-01-02	54.250	50.209999	50.720001	53.695000	35628920.0	45.872044	1.807099e+09
2012-01-03	59.285	53.900002	53.900002	58.880001	45359540.0	50.301620	2.444879e+09
2012-01-04	60.180	57.599998	58.799999	58.580002	42637270.0	50.045334	2.507071e+09
2012-01-05	60.250	57.509998	58.500000	58.205002	33051030.0	49.724968	1.933485e+09
2012-01-06	58.000	55.630001	57.799999	56.459999	36776010.0	48.234200	2.125653e+09

```
hindalco.head()
```

Date	High	Low	Open	Close	Volume	Adj Close	Total Traded
2012-01-02	117.250000	111.199997	117.000000	112.250000	9684493.0	103.367546	1.133086e+09
2012-01-03	116.000000	113.099998	114.199997	115.550003	13791200.0	106.406410	1.574955e+09
2012-01-04	119.000000	114.699997	117.000000	118.300003	12622715.0	108.938812	1.476858e+09
2012-01-05	119.099998	115.849998	118.150002	116.400002	7100627.0	107.189156	8.389391e+08
2012-01-06	119.699997	114.250000	115.900002	118.699997	7793768.0	109.307152	9.032977e+08

```
tatasteel['Total Traded'].plot(label ='TataSteel', figsize =(15,7))
jindalsteel['Total Traded'].plot(label ='JindalSteel', figsize =(15,7))
jswsteel['Total Traded'].plot(label ='JSWSteel', figsize =(15,7))
hindalco['Total Traded'].plot(label ='Hindalco', figsize =(15,7))
plt.legend()
plt.ylabel('Total Traded')
```

```
Text(0, 0.5, 'Total Traded')
```
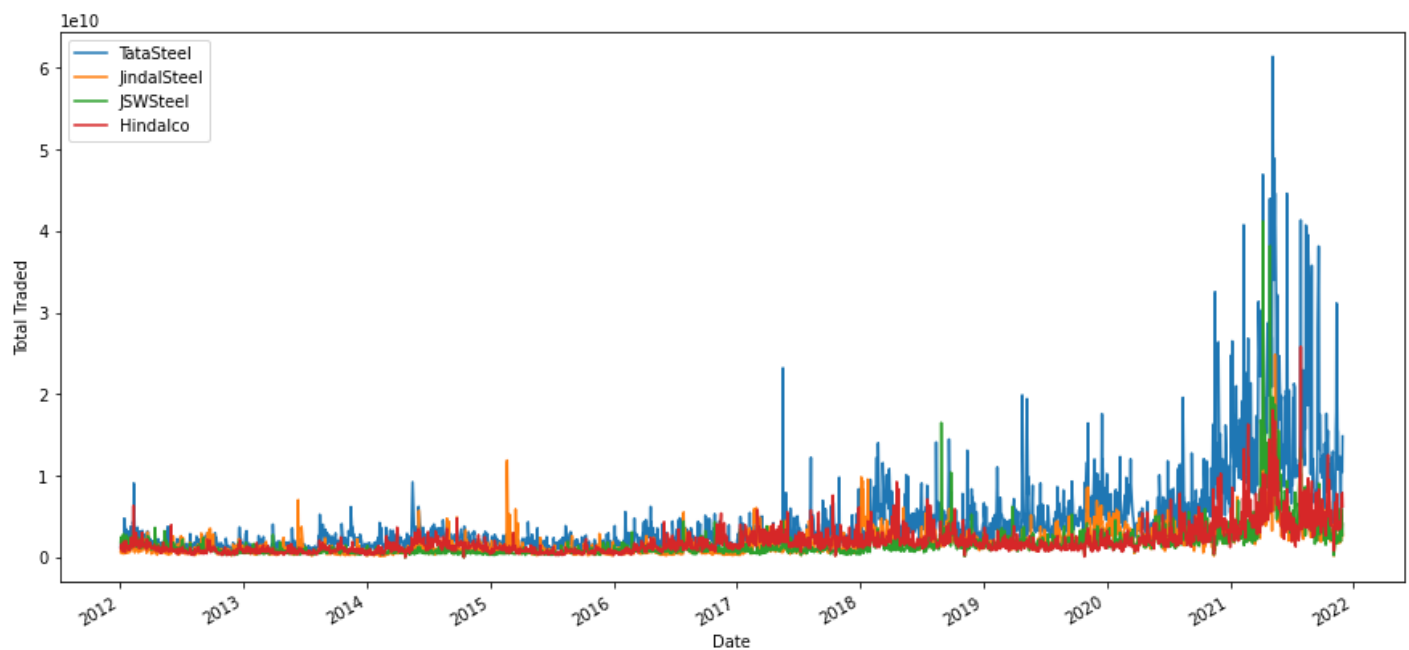
```
tatasteel['Total Traded'].argmax()
```

2301

```
tatasteel.iloc[[tatasteel['Total Traded'].argmax()]]
```

	High	Low	Open	Close	Volume	Adj Close	Total Traded
Date							
2021-05-07	1192.0	1130.099976	1135.0	1182.349976	54075433.0	1156.470093	6.137562e+10

```
jindalsteel['Open'].plot(label='No Moving Average', figsize =(15,7))
jindalsteel['MA50'] = jindalsteel['Open'].rolling(50).mean()
jindalsteel['MA50'].plot(label='MA50')
jindalsteel['MA200'] = jindalsteel['Open'].rolling(200).mean()
jindalsteel['MA200'].plot(label='MA200')
plt.legend()
```

<matplotlib.legend.Legend at 0x1e5f6b74470>
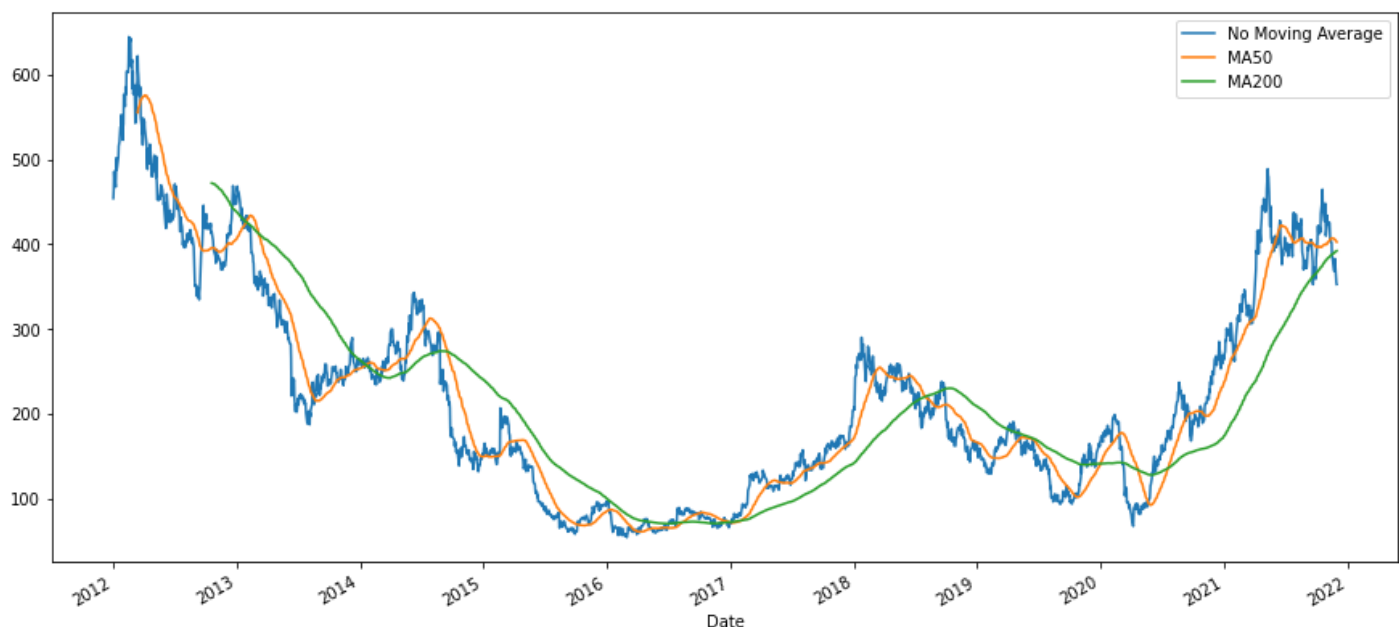
CORRELATION & SCATTER MATRIX

```python
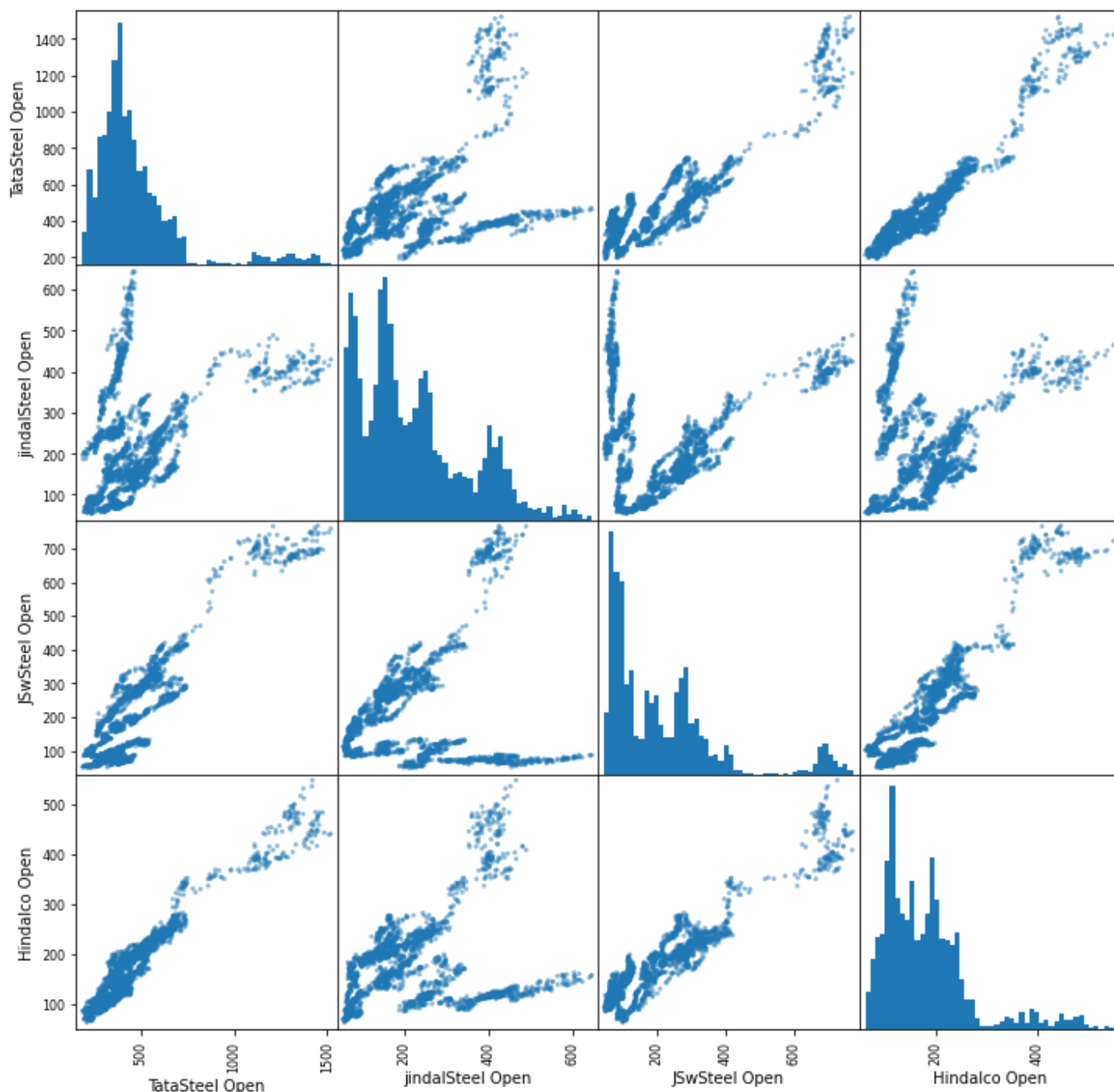from pandas.plotting import scatter_matrix
import pandas as pd
```

```python
car_comp = pd.concat([tatasteel['Open'],jindalsteel['Open'],jswsteel['Open'],hindalco['
car_comp.columns =['TataSteel Open', 'jindalSteel Open', 'JSwSteel Open', 'Hindalco Ope
```

```python
scatter_matrix(car_comp,figsize=(12,12),hist_kwds={'bins':50})
```

```
array([[<AxesSubplot:xlabel='TataSteel Open', ylabel='TataSteel Open'>,
        <AxesSubplot:xlabel='jindalSteel Open', ylabel='TataSteel Open'>,
        <AxesSubplot:xlabel='JSwSteel Open', ylabel='TataSteel Open'>,
        <AxesSubplot:xlabel='Hindalco Open', ylabel='TataSteel Open'>],
       [<AxesSubplot:xlabel='TataSteel Open', ylabel='jindalSteel Open'>,
        <AxesSubplot:xlabel='jindalSteel Open', ylabel='jindalSteel Open'>,
        <AxesSubplot:xlabel='JSwSteel Open', ylabel='jindalSteel Open'>,
        <AxesSubplot:xlabel='Hindalco Open', ylabel='jindalSteel Open'>],
       [<AxesSubplot:xlabel='TataSteel Open', ylabel='JSwSteel Open'>,
        <AxesSubplot:xlabel='jindalSteel Open', ylabel='JSwSteel Open'>,
        <AxesSubplot:xlabel='JSwSteel Open', ylabel='JSwSteel Open'>,
        <AxesSubplot:xlabel='Hindalco Open', ylabel='JSwSteel Open'>],
       [<AxesSubplot:xlabel='TataSteel Open', ylabel='Hindalco Open'>,
        <AxesSubplot:xlabel='jindalSteel Open', ylabel='Hindalco Open'>,
        <AxesSubplot:xlabel='JSwSteel Open', ylabel='Hindalco Open'>,
        <AxesSubplot:xlabel='Hindalco Open', ylabel='Hindalco Open'>]],
      dtype=object)
```

CANDLESTICK CHART

```
pip install  --upgrade mplfinance
```

Requirement already satisfied: mplfinance in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (0.12.8b6)
Requirement already satisfied: matplotlib in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from mplfinance)
(3.3.4)
Requirement already satisfied: pandas in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from mplfinance)
(1.1.5)
Requirement already satisfied: pillow>=6.2.0 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from matplotlib-

>mplfinance) (8.4.0)
Requirement already satisfied: pyparsing!=2.0.4,!=2.1.2,!=2.1.6,>=2.0.3 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from matplotlib-
>mplfinance) (2.4.7)
Requirement already satisfied: python-dateutil>=2.1 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from matplotlib-
>mplfinance) (2.8.2)
Requirement already satisfied: numpy>=1.15 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from matplotlib-
>mplfinance) (1.19.5)
Requirement already satisfied: kiwisolver>=1.0.1 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from matplotlib-
>mplfinance) (1.3.1)
Requirement already satisfied: cycler>=0.10 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from matplotlib-
>mplfinance) (0.11.0)
Requirement already satisfied: six>=1.5 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from python-
dateutil>=2.1->matplotlib->mplfinance) (1.16.0)
Requirement already satisfied: pytz>=2017.2 in
c:\users\hp\appdata\local\programs\python\python36\lib\site-packages (from pandas-
>mplfinance) (2021.3)
Note: you may need to restart the kernel to use updated packages.

WARNING: You are using pip version 21.2.4; however, version 21.3.1 is available.
You should consider upgrading via the
'c:\users\hp\appdata\local\programs\python\python36\python.exe -m pip install --upgrade
pip' command.

```python
from mplfinance.original_flavor import candlestick_ohlc
from matplotlib.dates import DateFormatter, date2num, WeekdayLocator,  DayLocator, MOND

tatasteel_reset =tatasteel.loc['2021-01': '2021-01'].reset_index()
tatasteel_reset['date_ax'] = tatasteel_reset['Date'].apply(lambda date: date2num(date))
tatasteel_values = [tuple(vals) for vals in tatasteel_reset[['date_ax','Open','High','L

mondays = WeekdayLocator(MONDAY)
alldays = DayLocator()
weekformatter = DateFormatter('%b %d')
dayFormatter = DateFormatter('%d')

fig, ax = plt.subplots()
candlestick_ohlc(ax,tatasteel_values, width =0.6, colorup ='g', colordown ='r')
```

([<matplotlib.lines.Line2D at 0x1e5fa1702e8>,
  <matplotlib.lines.Line2D at 0x1e5fa1a8d30>,
  <matplotlib.lines.Line2D at 0x1e5fa1b7320>,

```
<matplotlib.lines.Line2D at 0x1e5fa1b78d0>,
<matplotlib.lines.Line2D at 0x1e5fa1b7e80>,
<matplotlib.lines.Line2D at 0x1e5fa1c5470>,
<matplotlib.lines.Line2D at 0x1e5fa1c5a20>,
<matplotlib.lines.Line2D at 0x1e5fa1c5fd0>,
<matplotlib.lines.Line2D at 0x1e5fa1d25c0>,
<matplotlib.lines.Line2D at 0x1e5fa1d2b70>,
<matplotlib.lines.Line2D at 0x1e5fa1df160>,
<matplotlib.lines.Line2D at 0x1e5fa1df710>,
<matplotlib.lines.Line2D at 0x1e5fa1dfcc0>,
<matplotlib.lines.Line2D at 0x1e5fa1ee2b0>,
<matplotlib.lines.Line2D at 0x1e5fa1ee860>,
<matplotlib.lines.Line2D at 0x1e5fa1eee10>,
<matplotlib.lines.Line2D at 0x1e5fa1fa400>,
<matplotlib.lines.Line2D at 0x1e5fa1fa9b0>,
<matplotlib.lines.Line2D at 0x1e5fa1faf60>,
<matplotlib.lines.Line2D at 0x1e5fa20b550>],
[<matplotlib.patches.Rectangle at 0x1e5fa1a88d0>,
 <matplotlib.patches.Rectangle at 0x1e5fa1a8ef0>,
 <matplotlib.patches.Rectangle at 0x1e5fa1b74e0>,
 <matplotlib.patches.Rectangle at 0x1e5fa1b7a90>,
 <matplotlib.patches.Rectangle at 0x1e5fa1b7ef0>,
 <matplotlib.patches.Rectangle at 0x1e5fa1c5630>,
 <matplotlib.patches.Rectangle at 0x1e5fa1c5be0>,
 <matplotlib.patches.Rectangle at 0x1e5fa1d21d0>,
 <matplotlib.patches.Rectangle at 0x1e5fa1d2780>,
 <matplotlib.patches.Rectangle at 0x1e5fa1d2d30>,
 <matplotlib.patches.Rectangle at 0x1e5fa1df320>,
 <matplotlib.patches.Rectangle at 0x1e5fa1df8d0>,
 <matplotlib.patches.Rectangle at 0x1e5fa1dfe80>,
 <matplotlib.patches.Rectangle at 0x1e5fa1ee470>,
 <matplotlib.patches.Rectangle at 0x1e5fa1eea20>,
 <matplotlib.patches.Rectangle at 0x1e5fa1eefd0>,
 <matplotlib.patches.Rectangle at 0x1e5fa1fa5c0>,
 <matplotlib.patches.Rectangle at 0x1e5fa1fab70>,
 <matplotlib.patches.Rectangle at 0x1e5fa20b160>,
 <matplotlib.patches.Rectangle at 0x1e5fa20b710>])
```

DAILY PERCENTAGE CHANGE

```
tatasteel['Returns'] = (tatasteel['Close']/tatasteel['Close'].shift(1)) - 1
```

```
tatasteel.head()
```

Date	High	Low	Open	Close	Volume	Adj Close	Total Traded	returns	Re
2012-01-02	329.646881	316.403839	321.929718	324.978455	4036645.0	255.693100	1.299516e+09	NaN	
2012-01-03	346.605591	327.931946	328.694153	344.747742	6112021.0	271.247559	2.008986e+09	0.060833	0.06
2012-01-04	350.130707	339.460052	346.796143	346.748505	5721689.0	272.821747	1.984260e+09	0.005804	0.00
2012-01-05	353.941650	342.413544	347.748871	345.462311	4381464.0	271.809784	1.523649e+09	-0.003709	-0.00
2012-01-06	350.416534	333.648376	342.032440	346.462677	4779047.0	272.596893	1.634589e+09	0.002896	0.00

```
jswsteel['Returns'] = (jswsteel['Close']/jswsteel['Close'].shift(1)) - 1
```

```
jswsteel.head()
```

Date	High	Low	Open	Close	Volume	Adj Close	Total Traded	Returns
2012-01-02	54.250	50.209999	50.720001	53.695000	35628920.0	45.872044	1.807099e+09	NaN
2012-01-03	59.285	53.900002	53.900002	58.880001	45359540.0	50.301620	2.444879e+09	0.096564
2012-01-04	60.180	57.599998	58.799999	58.580002	42637270.0	50.045334	2.507071e+09	-0.005095
2012-01-05	60.250	57.509998	58.500000	58.205002	33051030.0	49.724968	1.933485e+09	-0.006402
2012-01-06	58.000	55.630001	57.799999	56.459999	36776010.0	48.234200	2.125653e+09	-0.029980

```
jindalsteel['Returns'] = (jindalsteel['Close']/jindalsteel['Close'].shift(1)) - 1
```

```
hindalco['Returns'] = (hindalco['Close']/hindalco['Close'].shift(1)) - 1
```

```
jindalsteel.head()
```

Date	High	Low	Open	Close	Volume	Adj Close	Total Traded	MA50	MA200
2012-01-02	464.000000	442.200012	454.200012	460.549988	1507558.0	455.179138	6.847329e+08	NaN	NaN
2012-01-03	493.399994	463.000000	463.500000	486.799988	2357829.0	481.123016	1.092854e+09	NaN	NaN

Date	High	Low	Open	Close	Volume	Adj Close	Total Traded	MA50	MA200
2012-01-04	494.799988	472.600006	485.950012	477.049988	1976173.0	471.486725	9.603213e+08	NaN	NaN
2012-01-05	485.500000	475.149994	478.399994	481.649994	979963.0	476.033081	4.688143e+08	NaN	NaN
2012-01-06	479.450012	461.649994	476.100006	466.250000	1129321.0	460.812683	5.376697e+08	NaN	NaN

```
hindalco.head()
```

Date	High	Low	Open	Close	Volume	Adj Close	Total Traded	Returns
2012-01-02	117.250000	111.199997	117.000000	112.250000	9684493.0	103.367546	1.133086e+09	NaN
2012-01-03	116.000000	113.099998	114.199997	115.550003	13791200.0	106.406410	1.574955e+09	0.029399
2012-01-04	119.000000	114.699997	117.000000	118.300003	12622715.0	108.938812	1.476858e+09	0.023799
2012-01-05	119.099998	115.849998	118.150002	116.400002	7100627.0	107.189156	8.389391e+08	-0.016061
2012-01-06	119.699997	114.250000	115.900002	118.699997	7793768.0	109.307152	9.032977e+08	0.019759

```
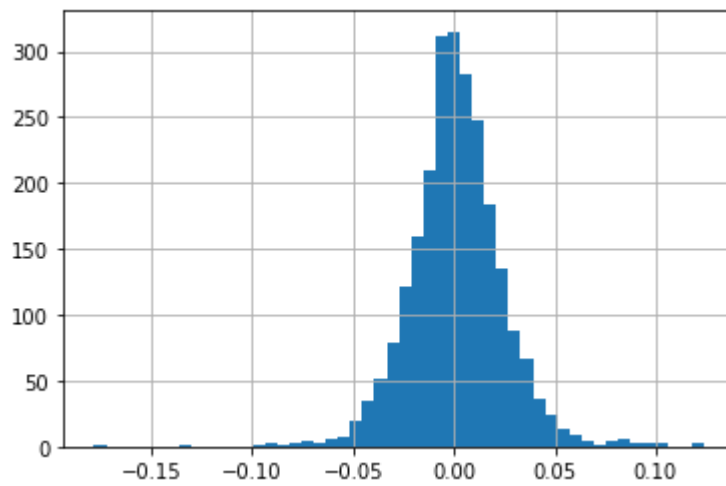tatasteel['Returns'].hist(bins=50)
```

<AxesSubplot:>
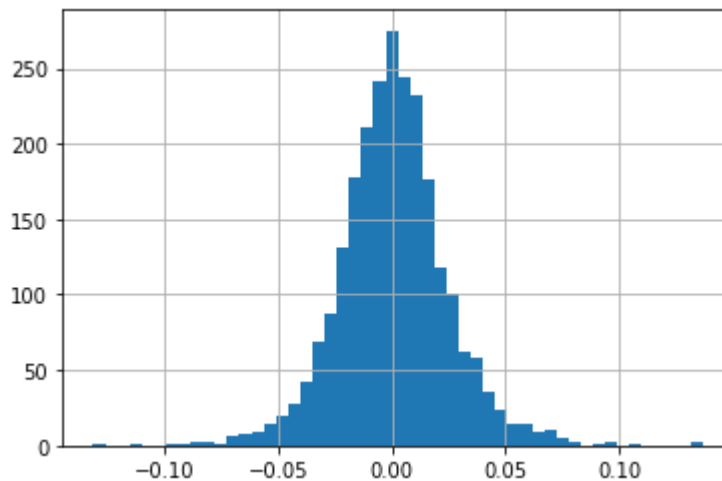

```
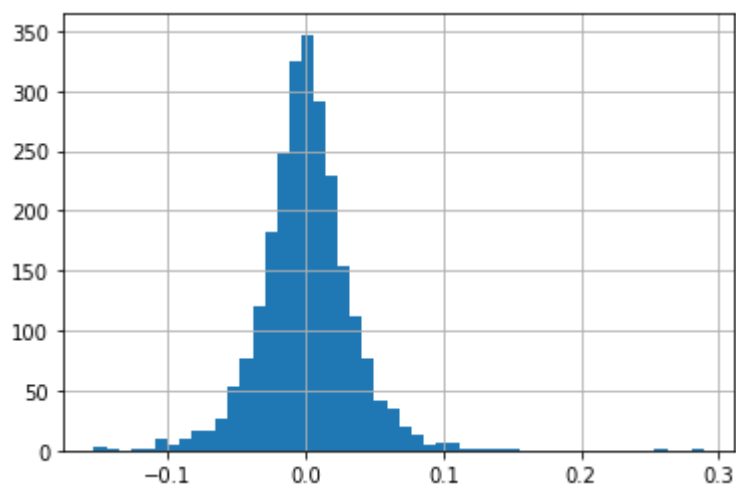jswsteel['Returns'].hist(bins=50)
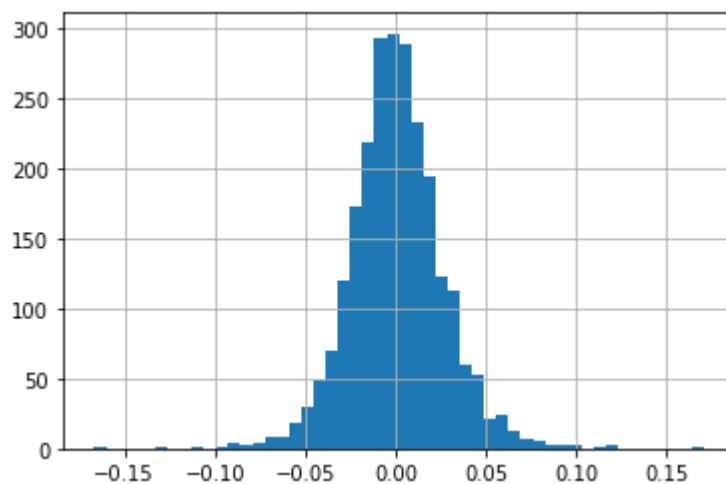```

<AxesSubplot:>

```
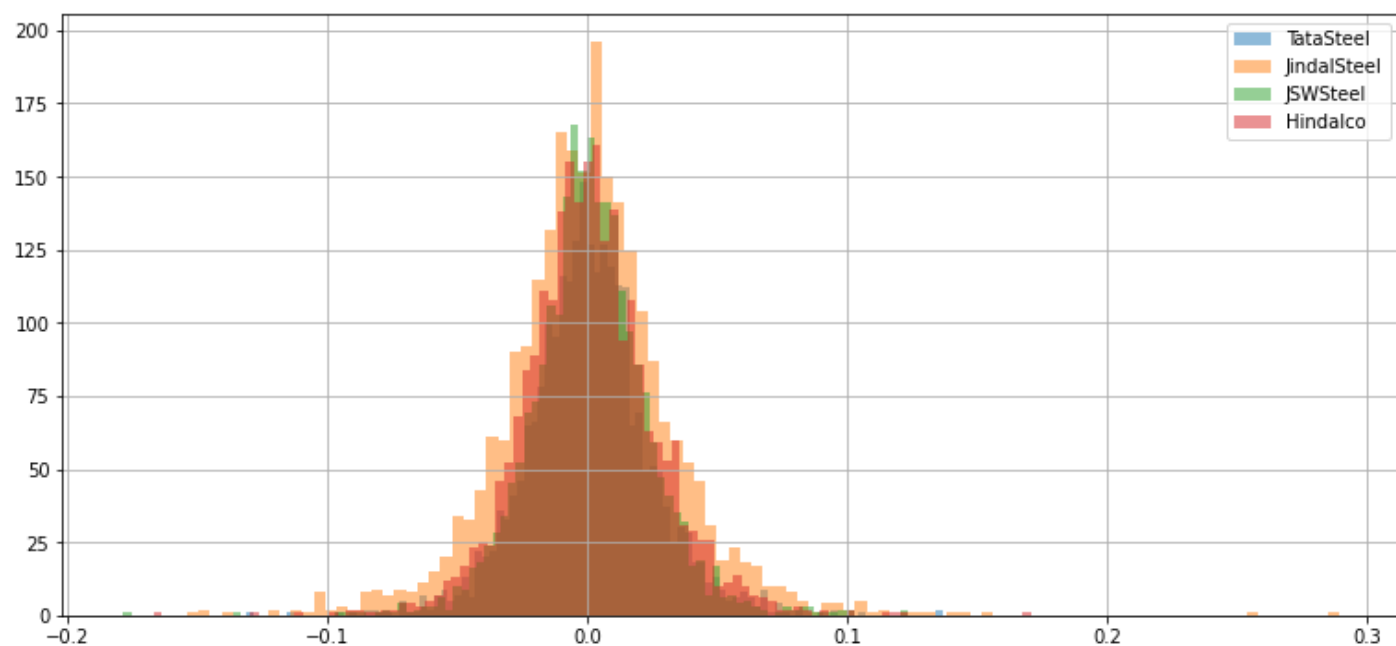jindalsteel['Returns'].hist(bins=50)
```

<AxesSubplot:>


```
hindalco['Returns'].hist(bins=50)
```

<AxesSubplot:>


```
tatasteel['Returns'].hist(bins=100, label ='TataSteel',alpha = 0.5, figsize=(13,6))
jindalsteel['Returns'].hist(bins=100, label = 'JindalSteel',alpha= 0.5)
jswsteel['Returns'].hist(bins=100, label = 'JSWSteel', alpha = 0.5)
hindalco['Returns'].hist(bins=100, label = 'Hindalco',alpha = 0.5)
plt.legend()
```

<matplotlib.legend.Legend at 0x1e5fbcc1940>


```
tatasteel['Returns'].plot(kind='kde',label='Tatasteel', figsize =(15,6))
jindalsteel['Returns'].plot(kind='kde',label='Jindalsteel', figsize =(15,6))
jswsteel['Returns'].plot(kind='kde',label='JSWsteel', figsize =(15,6))
hindalco['Returns'].plot(kind='kde',label='Hindalco', figsize =(15,6))
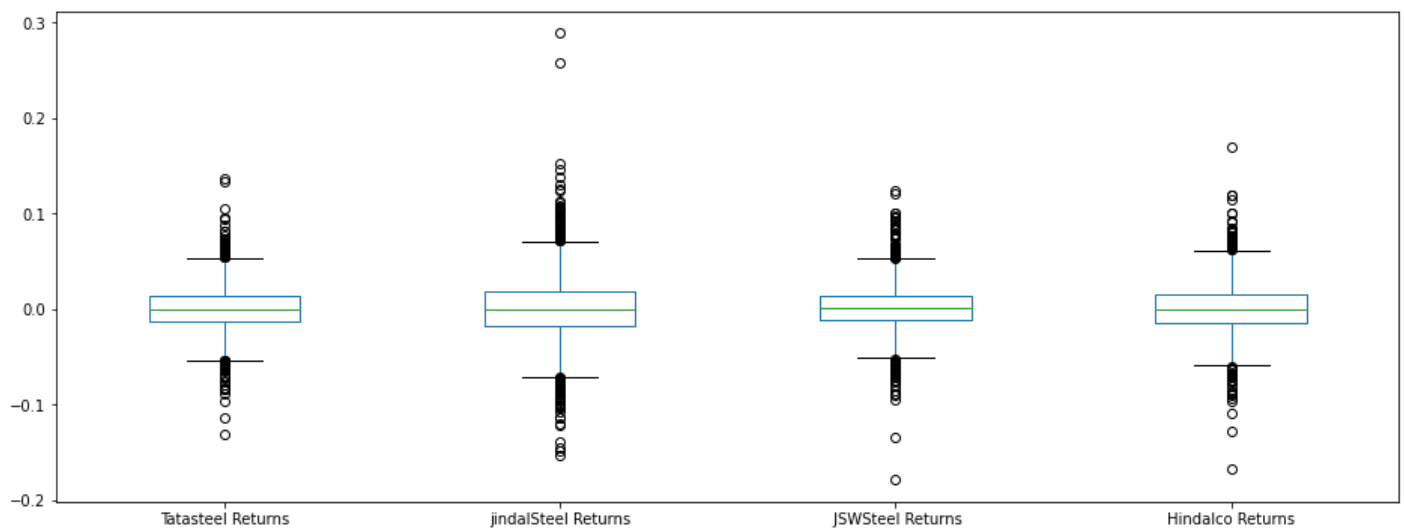plt.legend()
```

<matplotlib.legend.Legend at 0x1e586400f60>
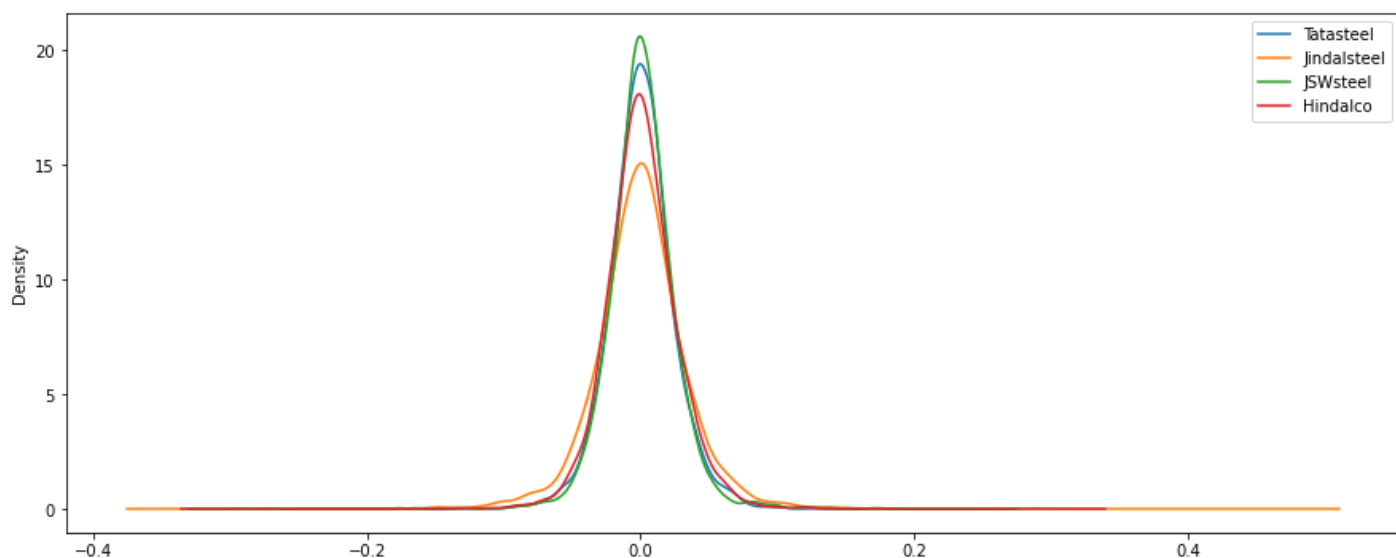
BOX PLOT

```
box_df = pd.concat([tatasteel['Returns'], jindalsteel['Returns'], jswsteel['Returns'],
box_df.columns = ['Tatasteel Returns', 'jindalSteel Returns', ' JSWSteel Returns', 'Hir
box_df.plot(kind='box', figsize = (16,6))
```

<AxesSubplot:>

```
scatter_matrix(box_df, figsize=(10,10), hist_kwds ={'bins' : 50},alpha=0.25)
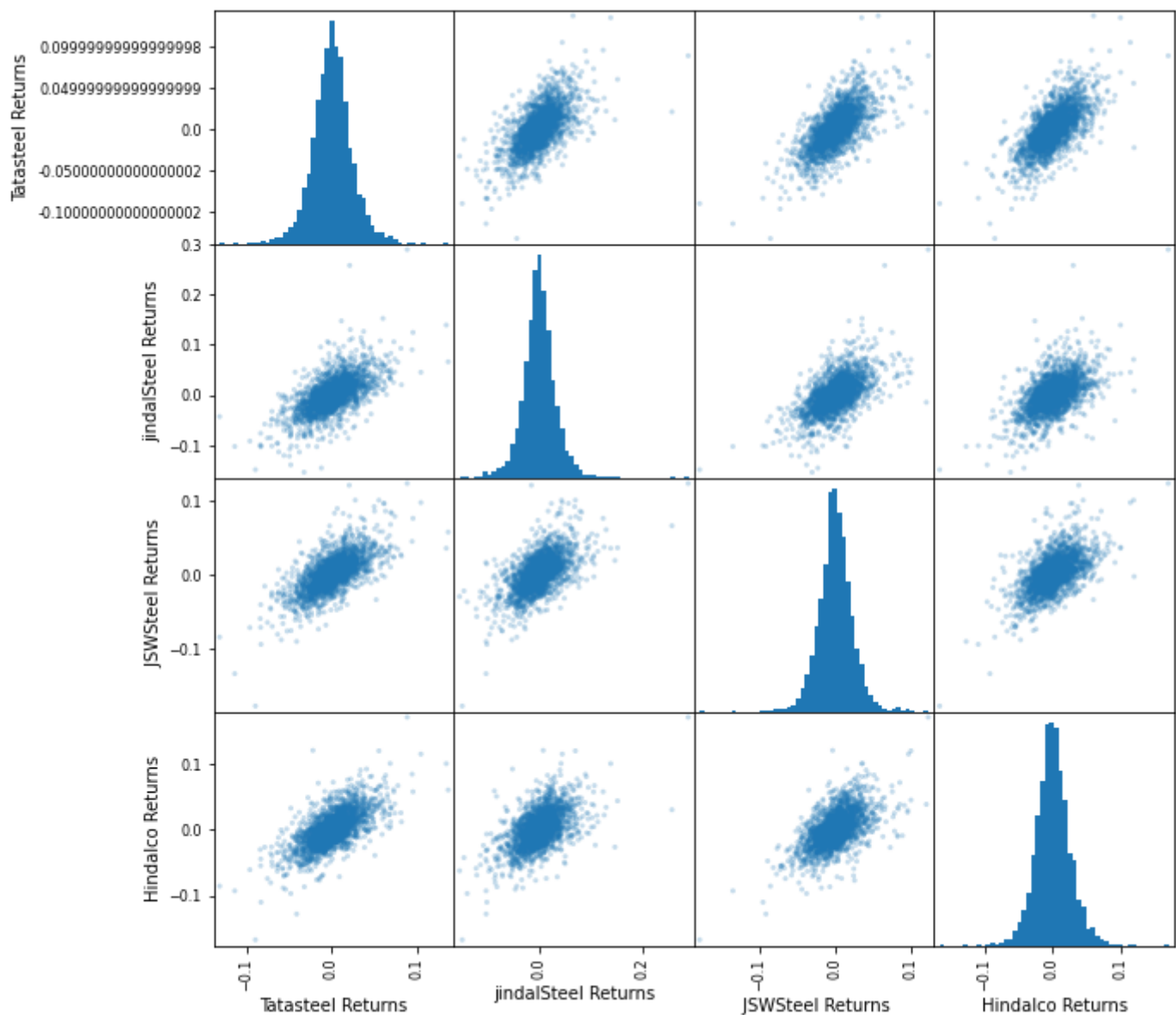```

```
array([[<AxesSubplot:xlabel='Tatasteel Returns', ylabel='Tatasteel Returns'>,
        <AxesSubplot:xlabel='jindalSteel Returns', ylabel='Tatasteel Returns'>,
        <AxesSubplot:xlabel=' JSWSteel Returns', ylabel='Tatasteel Returns'>,
        <AxesSubplot:xlabel='Hindalco Returns', ylabel='Tatasteel Returns'>],
       [<AxesSubplot:xlabel='Tatasteel Returns', ylabel='jindalSteel Returns'>,
        <AxesSubplot:xlabel='jindalSteel Returns', ylabel='jindalSteel Returns'>,
        <AxesSubplot:xlabel=' JSWSteel Returns', ylabel='jindalSteel Returns'>,
        <AxesSubplot:xlabel='Hindalco Returns', ylabel='jindalSteel Returns'>],
       [<AxesSubplot:xlabel='Tatasteel Returns', ylabel=' JSWSteel Returns'>,
        <AxesSubplot:xlabel='jindalSteel Returns', ylabel=' JSWSteel Returns'>,
        <AxesSubplot:xlabel=' JSWSteel Returns', ylabel=' JSWSteel Returns'>,
        <AxesSubplot:xlabel='Hindalco Returns', ylabel=' JSWSteel Returns'>],
       [<AxesSubplot:xlabel='Tatasteel Returns', ylabel='Hindalco Returns'>,
        <AxesSubplot:xlabel='jindalSteel Returns', ylabel='Hindalco Returns'>,
        <AxesSubplot:xlabel=' JSWSteel Returns', ylabel='Hindalco Returns'>,
        <AxesSubplot:xlabel='Hindalco Returns', ylabel='Hindalco Returns'>]],
      dtype=object)
```

CUMULATIVE RETRUN

```
tatasteel['Cumulative Return'] = (1+ tatasteel['Returns']).cumprod()
jindalsteel['Cumulative Return'] = (1+ jindalsteel['Returns']).cumprod()
jswsteel['Cumulative Return'] = (1+ jswsteel['Returns']).cumprod()
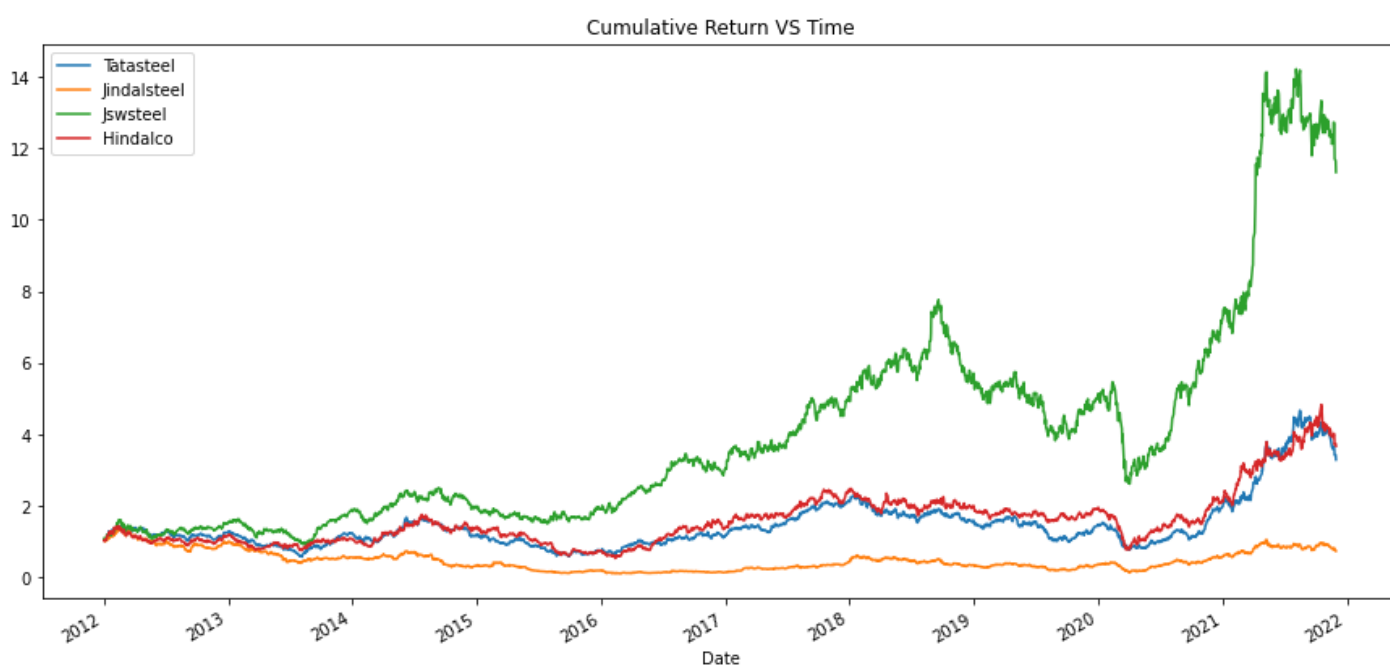hindalco['Cumulative Return'] = (1+ hindalco['Returns']).cumprod()
```

```
tatasteel.head()
```

Date	High	Low	Open	Close	Volume	Adj Close	Total Traded	returns	Re
2012-01-02	329.646881	316.403839	321.929718	324.978455	4036645.0	255.693100	1.299516e+09	NaN	
2012-01-03	346.605591	327.931946	328.694153	344.747742	6112021.0	271.247559	2.008986e+09	0.060833	0.06
2012-01-04	350.130707	339.460052	346.796143	346.748505	5721689.0	272.821747	1.984260e+09	0.005804	0.00

	High	Low	Open	Close	Volume	Adj Close	Total Traded	returns	Re
Date									
2012-01-05	353.941650	342.413544	347.748871	345.462311	4381464.0	271.809784	1.523649e+09	-0.003709	-0.00
2012-01-06	350.416534	333.648376	342.032440	346.462677	4779047.0	272.596893	1.634589e+09	0.002896	0.00

```python
tatasteel['Cumulative Return'].plot(label = 'Tatasteel', figsize =(15,7))
jindalsteel['Cumulative Return'].plot(label = 'Jindalsteel', figsize =(15,7))
jswsteel['Cumulative Return'].plot(label = 'Jswsteel', figsize =(15,7))
hindalco['Cumulative Return'].plot(label = 'Hindalco', figsize =(15,7))
plt.title('Cumulative Return VS Time')
plt.legend()
```

<matplotlib.legend.Legend at 0x1e58c8997f0>


```python
jovian.commit()
```