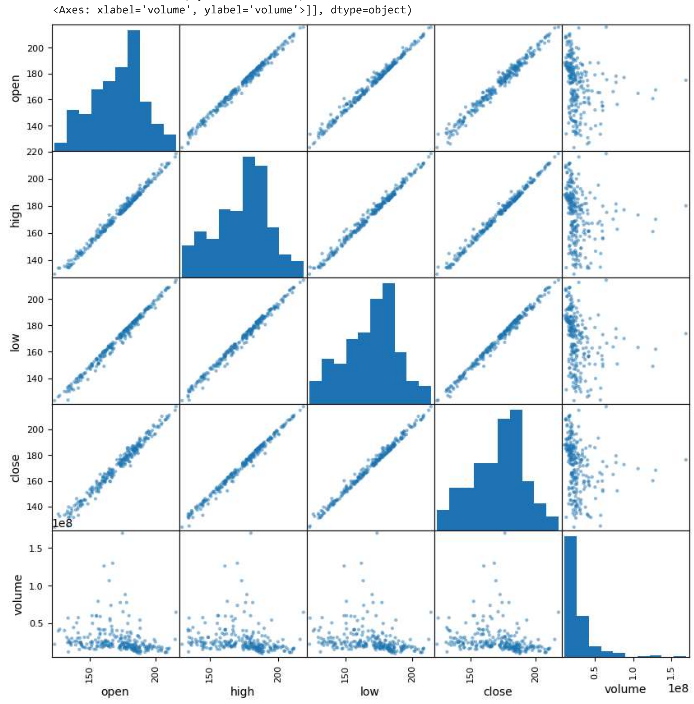
Submitted by: Angelo Luis C. Cu

```
%matplotlib inline
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd
fb = pd.read_csv(
  'data/fb_stock_prices_2018.csv', index_col='date', parse_dates=True
)
```

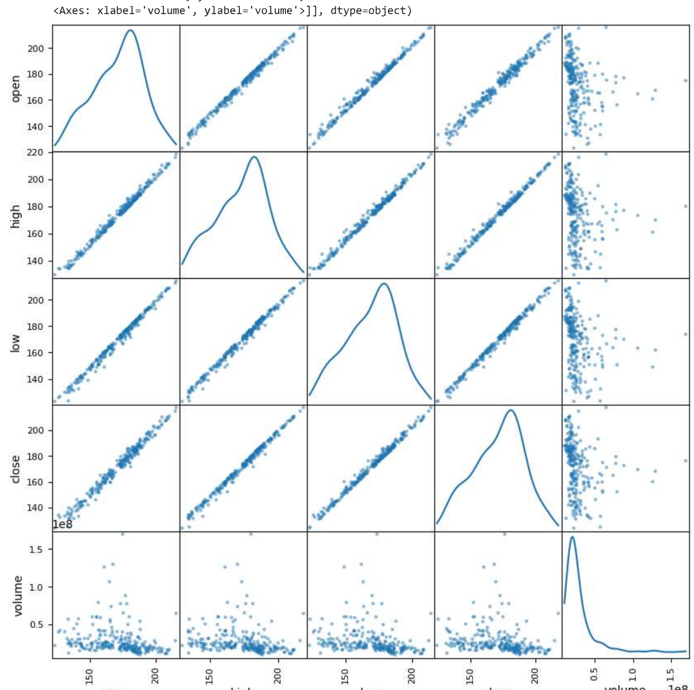
```
from pandas.plotting import scatter_matrix
scatter_matrix(fb, figsize=(10, 10)) # creates a scatter matrix
```

```
array([[<Axes: xlabel='open', ylabel='open'>,
        <Axes: xlabel='high', ylabel='open'>,
        <Axes: xlabel='low', ylabel='open'>,
        <Axes: xlabel='close', ylabel='open'>,
        <Axes: xlabel='volume', ylabel='open'>],
       [<Axes: xlabel='open', ylabel='high'>,
        <Axes: xlabel='high', ylabel='high'>,
        <Axes: xlabel='low', ylabel='high'>,
        <Axes: xlabel='close', ylabel='high'>,
        <Axes: xlabel='volume', ylabel='high'>],
       [<Axes: xlabel='open', ylabel='low'>,
        <Axes: xlabel='high', ylabel='low'>,
        <Axes: xlabel='low', ylabel='low'>,
        <Axes: xlabel='close', ylabel='low'>,
        <Axes: xlabel='volume', ylabel='low'>],
       [<Axes: xlabel='open', ylabel='close'>,
        <Axes: xlabel='high', ylabel='close'>,
        <Axes: xlabel='low', ylabel='close'>,
        <Axes: xlabel='close', ylabel='close'>,
        <Axes: xlabel='volume', ylabel='close'>],
       [<Axes: xlabel='open', ylabel='volume'>,
        <Axes: xlabel='high', ylabel='volume'>,
        <Axes: xlabel='low', ylabel='volume'>,
        <Axes: xlabel='close', ylabel='volume'>,
        <Axes: xlabel='volume', ylabel='volume'>]], dtype=object)
```



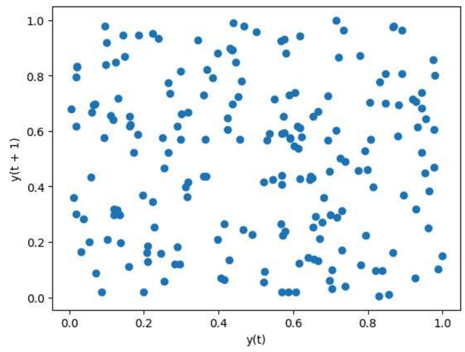

```
scatter_matrix(fb, figsize=(10, 10), diagonal='kde') # changes the diagonal to kernel density estimation
```

```
array([[<Axes: xlabel='open', ylabel='open'>,
        <Axes: xlabel='high', ylabel='open'>,
        <Axes: xlabel='low', ylabel='open'>,
        <Axes: xlabel='close', ylabel='open'>,
        <Axes: xlabel='volume', ylabel='open'>],
       [<Axes: xlabel='open', ylabel='high'>,
        <Axes: xlabel='high', ylabel='high'>,
        <Axes: xlabel='low', ylabel='high'>,
        <Axes: xlabel='close', ylabel='high'>,
        <Axes: xlabel='volume', ylabel='high'>],
       [<Axes: xlabel='open', ylabel='low'>,
        <Axes: xlabel='high', ylabel='low'>,
        <Axes: xlabel='low', ylabel='low'>,
        <Axes: xlabel='close', ylabel='low'>,
        <Axes: xlabel='volume', ylabel='low'>],
       [<Axes: xlabel='open', ylabel='close'>,
        <Axes: xlabel='high', ylabel='close'>,
        <Axes: xlabel='low', ylabel='close'>,
        <Axes: xlabel='close', ylabel='close'>,
        <Axes: xlabel='volume', ylabel='close'>],
       [<Axes: xlabel='open', ylabel='volume'>,
        <Axes: xlabel='high', ylabel='volume'>,
        <Axes: xlabel='low', ylabel='volume'>,
        <Axes: xlabel='close', ylabel='volume'>,
        <Axes: xlabel='volume', ylabel='volume'>]], dtype=object)
```



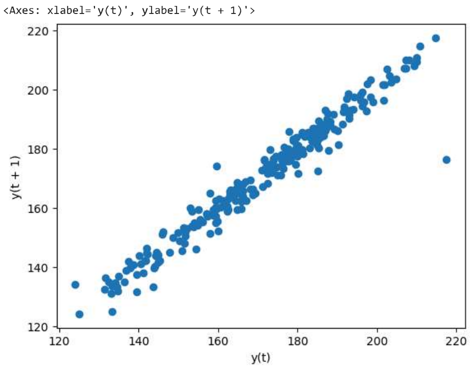

```
from pandas.plotting import lag_plot
np.random.seed(0) # seed makes the randomness repeatable with different notebooks
lag_plot(pd.Series(np.random.random(size=200))) # creates a lag plot with random data
```

```
<Axes: xlabel='y(t)', ylabel='y(t + 1)'>
```



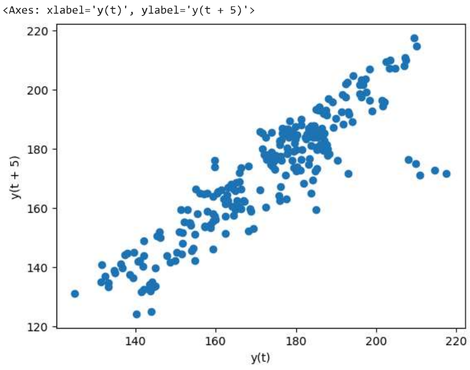

```
lag_plot(fb.close) # creates a lag plot for fb's close column
# line shows a positive correlation
```

```
<Axes: xlabel='y(t)', ylabel='y(t + 1)'>
```



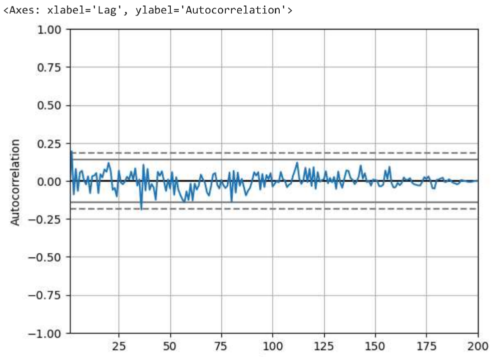

```
lag_plot(fb.close, lag=5) # sets the lag to 5, default is 1
# in this context, the lag is in days
```

```
<Axes: xlabel='y(t)', ylabel='y(t + 5)'>
```



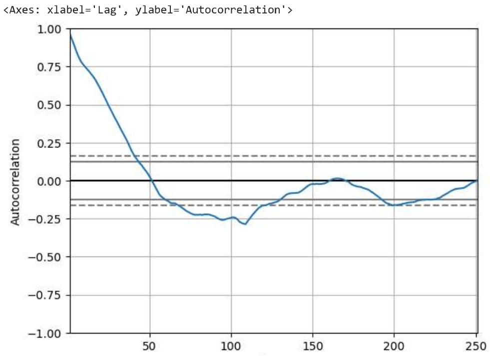

```
from pandas.plotting import autocorrelation_plot
np.random.seed(0)
autocorrelation_plot(pd.Series(np.random.random(size=200))) # creates an autocorrelation plot for random data
# it can be noticed that the correlation stays within +- 0.25, meaning very weak correlation
```

```
<Axes: xlabel='Lag', ylabel='Autocorrelation'>
```

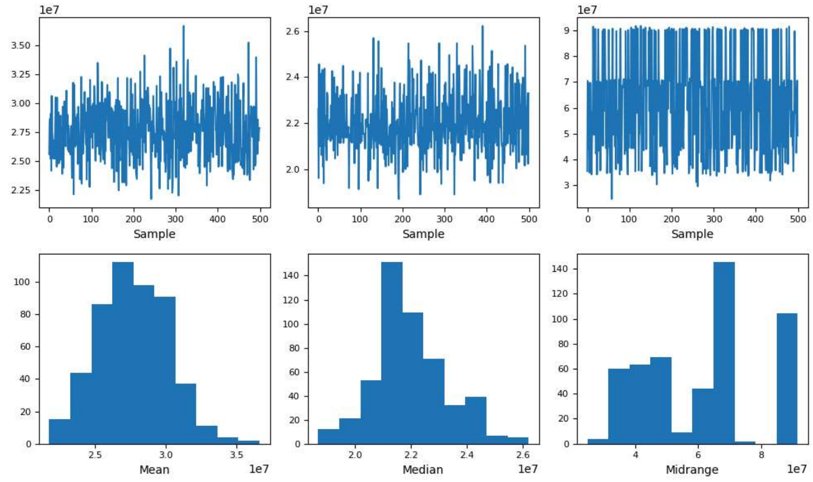



```
autocorrelation_plot(fb.close) # creates an autocorrelation plot for fb's close data
# notice that there is an almost 1.0 correlation
```

```
<Axes: xlabel='Lag', ylabel='Autocorrelation'>
```




```
from pandas.plotting import bootstrap_plot
fig = bootstrap_plot(fb.volume, fig=plt.figure(figsize=(10, 6))) # creates a bootstrap plot
```


1e7
Sample
1e7
Sample
1e7
Sample
Mean
1e7
Median
1e7
Midrange
1e7