Momentum

September 29, 2021

1 Momentum

https://stockcharts.com/school/doku.php?id=chart_school:trading_strategies:moving_momentum

https://en.wikipedia.org/wiki/Momentum_(technical_analysis)

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

import warnings
warnings.filterwarnings("ignore")

# fix_yahoo_finance is used to fetch data
import fix_yahoo_finance as yf
yf.pdr_override()
```

[2]:
```
# input
symbol = 'AAPL'
start = '2018-01-01'
end = '2019-01-01'

# Read data
df = yf.download(symbol,start,end)

# View Columns
df.head()
```

```
[**********************100%**********************]  1 of 1 downloaded
```

[2]:

Date	Open	High	Low	Close	Adj Close
2018-01-02	170.160004	172.300003	169.259995	172.259995	168.339050
2018-01-03	172.529999	174.550003	171.960007	172.229996	168.309738
2018-01-04	172.539993	173.470001	172.080002	173.029999	169.091522
2018-01-05	173.440002	175.369995	173.050003	175.000000	171.016678
2018-01-08	174.350006	175.610001	173.929993	174.350006	170.381485

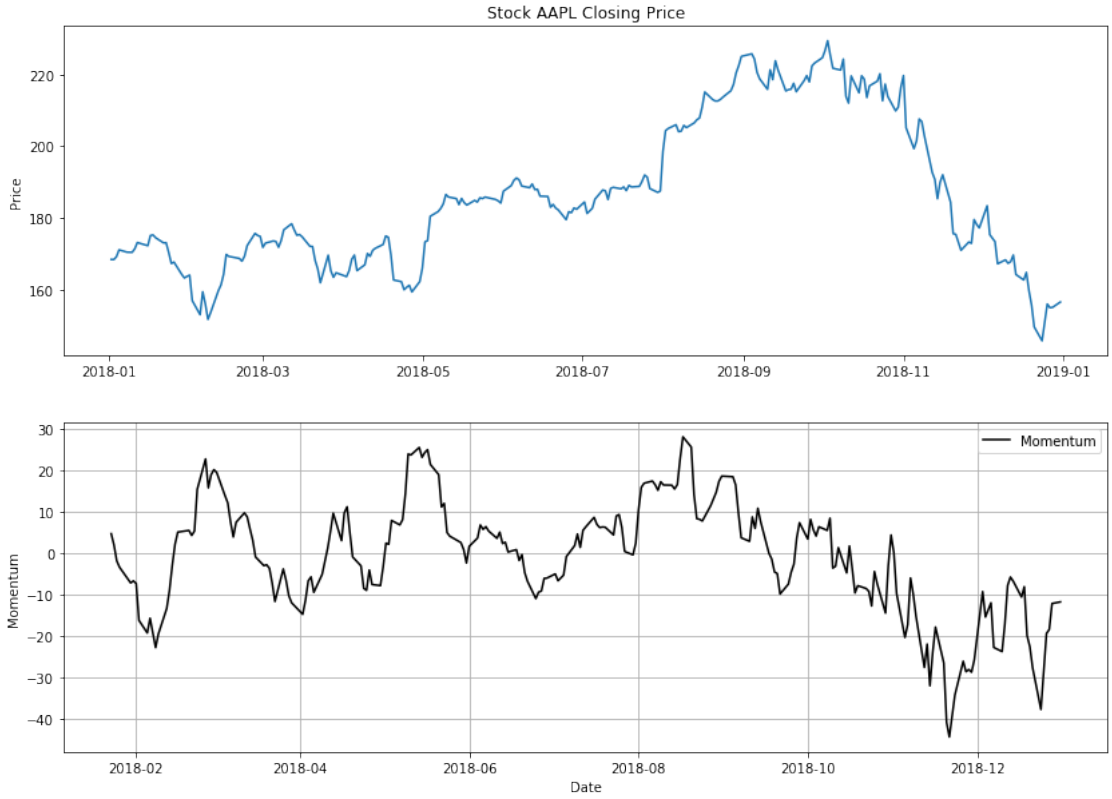
```
               Volume
Date
2018-01-02  25555900
2018-01-03  29517900
2018-01-04  22434600
2018-01-05  23660000
2018-01-08  20567800
```

[3]:
```
n = 14
df['Momentum'] = df['Adj Close'] - df['Adj Close'].shift(n)
```

[4]:
```
fig = plt.figure(figsize=(14,10))
ax1 = plt.subplot(2, 1, 1)
ax1.plot(df['Adj Close'])
ax1.set_title('Stock '+ symbol +' Closing Price')
ax1.set_ylabel('Price')

ax2 = plt.subplot(2, 1, 2)
ax2.plot(df['Momentum'], label='Momentum', color='black')
#ax2.axhline(y=0, color='blue', linestyle='--')
#ax2.axhline(y=10, color='red')
#ax2.axhline(y=-10, color='green')
ax2.grid()
ax2.set_ylabel('Momentum')
ax2.set_xlabel('Date')
ax2.legend(loc='best')
```

[4]:
```
<matplotlib.legend.Legend at 0x16ec8816a58>
```



1.1 Candlestick with Momentum

[5]:
```
from matplotlib import dates as mdates
import datetime as dt

dfc = df.copy()
dfc['VolumePositive'] = dfc['Open'] < dfc['Adj Close']
#dfc = dfc.dropna()
dfc = dfc.reset_index()
dfc['Date'] = mdates.date2num(dfc['Date'].astype(dt.date))
dfc.head()
```

[5]:

	Date	Open	High	Low	Close	Adj Close	Volume	Momentum	VolumePositive
0	736696.0	170.160004	172.300003	169.259995	172.259995	168.339050	25555900	NaN	False
1	736697.0	172.529999	174.550003	171.960007	172.229996	168.309738			
2	736698.0	172.539993	173.470001	172.080002	173.029999	169.091522			
3	736699.0	173.440002	175.369995	173.050003	175.000000	171.016678			
4	736702.0	174.350006	175.610001	173.929993	174.350006	170.381485			

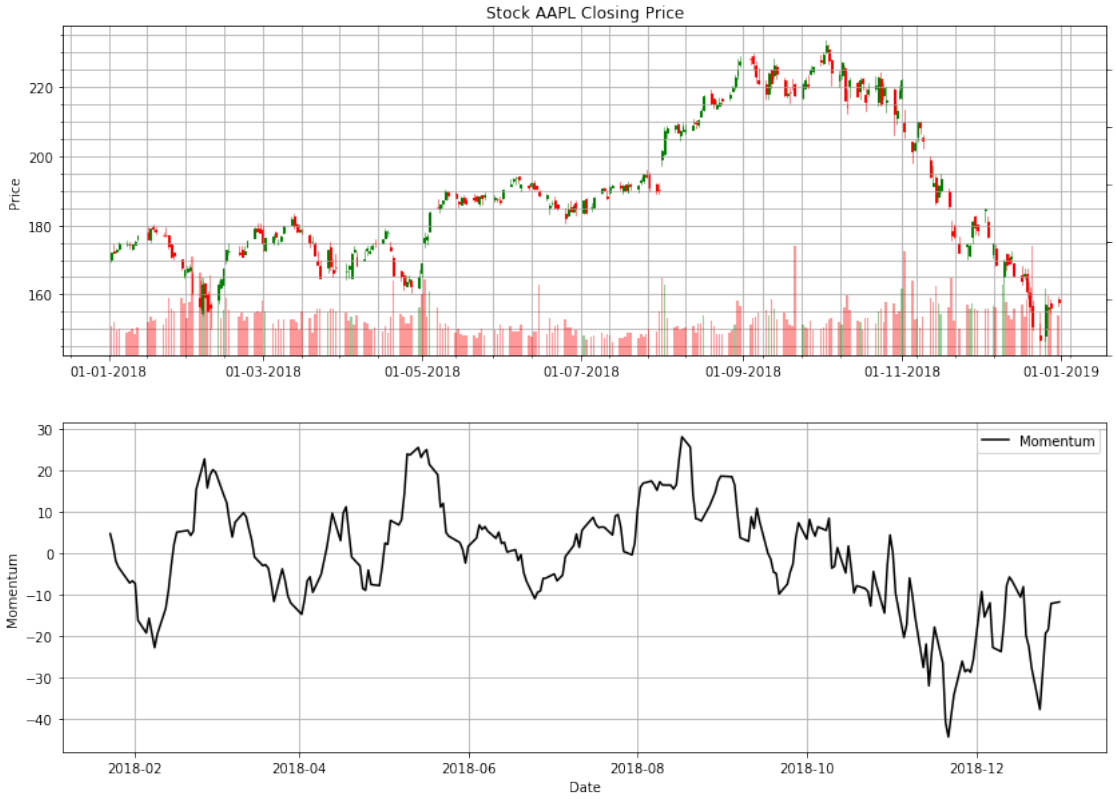
```
1  29517900       NaN           False
2  22434600       NaN           False
3  23660000       NaN           False
4  20567800       NaN           False
```

[6]:
```
from mpl_finance import candlestick_ohlc

fig = plt.figure(figsize=(14,10))
ax1 = plt.subplot(2, 1, 1)
candlestick_ohlc(ax1,dfc.values, width=0.5, colorup='g', colordown='r', alpha=1.
 ↪0)
ax1.xaxis_date()
ax1.xaxis.set_major_formatter(mdates.DateFormatter('%d-%m-%Y'))
ax1.grid(True, which='both')
ax1.minorticks_on()
ax1v = ax1.twinx()
colors = dfc.VolumePositive.map({True: 'g', False: 'r'})
ax1v.bar(dfc.Date, dfc['Volume'], color=colors, alpha=0.4)
ax1v.axes.yaxis.set_ticklabels([])
ax1v.set_ylim(0, 3*df.Volume.max())
ax1.set_title('Stock '+ symbol +' Closing Price')
ax1.set_ylabel('Price')

ax2 = plt.subplot(2, 1, 2)
ax2.plot(df['Momentum'], label='Momentum', color='black')
ax2.grid()
ax2.set_ylabel('Momentum')
ax2.set_xlabel('Date')
ax2.legend(loc='best')
```

[6]:
```
<matplotlib.legend.Legend at 0x16eca262b70>
```


Stock AAPL Closing Price
Price
220
200
180
160
01-01-2018
01-03-2018
01-05-2018
01-07-2018
01-09-2018
01-11-2018
01-01-2019
Momentum
30
20
10
0
−10
−20
−30
−40
2018-02
2018-04
2018-06
2018-08
2018-10
2018-12
Date