New_Highs_New_Lows

September 29, 2021

1 Market Breadth: 52-Week Highs/Lows

1.1 New Highs New Lows

https://www.investopedia.com/university/marketbreadth/marketbreadth2.asp

https://www.marketinout.com/technical_analysis.php?t=New_Highs-New_Lows&id=70

https://stockcharts.com/school/doku.php?id=chart_school:market_indicators:high_low_index

```
[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 = 'SPY'
     start = '2012-01-01'
     end = '2019-01-01'

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

     # View Columns
     df.head()
```

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

```
[2]:                   Open        High         Low       Close   Adj Close  \
     Date
     2012-01-03  127.760002  128.380005  127.430000  127.500000  110.244629
     2012-01-04  127.199997  127.809998  126.709999  127.699997  110.417557
     2012-01-05  127.010002  128.229996  126.430000  128.039993  110.711548
```

```
2012-01-06  128.199997  128.220001  127.290001  127.709999  110.426208
2012-01-09  128.000000  128.179993  127.410004  128.020004  110.694260

               Volume
Date
2012-01-03  193697900
2012-01-04  127186500
2012-01-05  173895000
2012-01-06  148050000
2012-01-09   99530200
```

[3]:
```
df.tail()
```

[3]:
```
                  Open        High         Low       Close   Adj Close  \
Date
2018-12-24  239.039993  240.839996  234.270004  234.339996  233.312317
2018-12-26  235.970001  246.179993  233.759995  246.179993  245.100388
2018-12-27  242.570007  248.289993  238.960007  248.070007  246.982117
2018-12-28  249.580002  251.399994  246.449997  247.750000  246.663513
2018-12-31  249.559998  250.190002  247.470001  249.919998  248.823990

               Volume
Date
2018-12-24  147311600
2018-12-26  218485400
2018-12-27  186267300
2018-12-28  153100200
2018-12-31  144299400
```

[4]:
```
new_high = df['Adj Close'].rolling(52).max() # 52-week lows
new_low = df['Adj Close'].rolling(52).min() # 52-week highs
```

[5]:
```
print("Yesterday's Value:", df['Adj Close'][-2]) # Yesterday's Value
print("Current Value:", df['Adj Close'][-1]) # Current's Value
```

```
Yesterday's Value: 246.663513
Current Value: 248.82399
```

[6]:
```
new_high = new_high.dropna()
new_low = new_low.dropna()
#Record_High_Percent = (new_high /(new_high + new_low)) * 100
#nhnl = new_high - new_low
```

[7]:
```
# 1. Cumulative New High/Low Line
# Today's Value = Yesterday's Value + (Today's New Highs - Today's New Lows)
df['CNHL'] = df['Adj Close'][1] + (new_high - new_low)
```

[8]:

```
# 2. New-High Minus New-Low Oscillator
# Oscillator = Today\'s New Highs - Today\'s New Lows
df['Oscillator'] = new_high - new_low
```

[9]:

```
# 3. New High/Low Ratio
# Ratio = Today\'s New Highs / Today\'s New Lows
df['Ratio'] = new_high / new_low
```

[10]:

```
# 4. Percentage of New-High to New High + New Low
# % New Highs = Today\'s New Highs / (Today\'s New Highs + Today\'s New Lows)
# % New Lows = Today\'s New Lows / (Today\'s New Highs + Today\'s New Lows)
df['NH'] = new_high/ (new_high + new_low)
df['NL'] = new_high/ (new_high + new_low)
```

[11]:

```
# 5. Percentage of New Highs to Total Market
# % New Highs = Today\'s New Highs / Total # of Listed Stocks in Given Market
# % New Lows = Today\'s New Lows / Total # of Listed Stocks in Given Market
df['NHTM'] = new_high / 5 # Number of stocks
df['NLTM'] = new_low / 5 # Number of stocks
```

[12]:

```
df = df.dropna()
df.head(10)
```

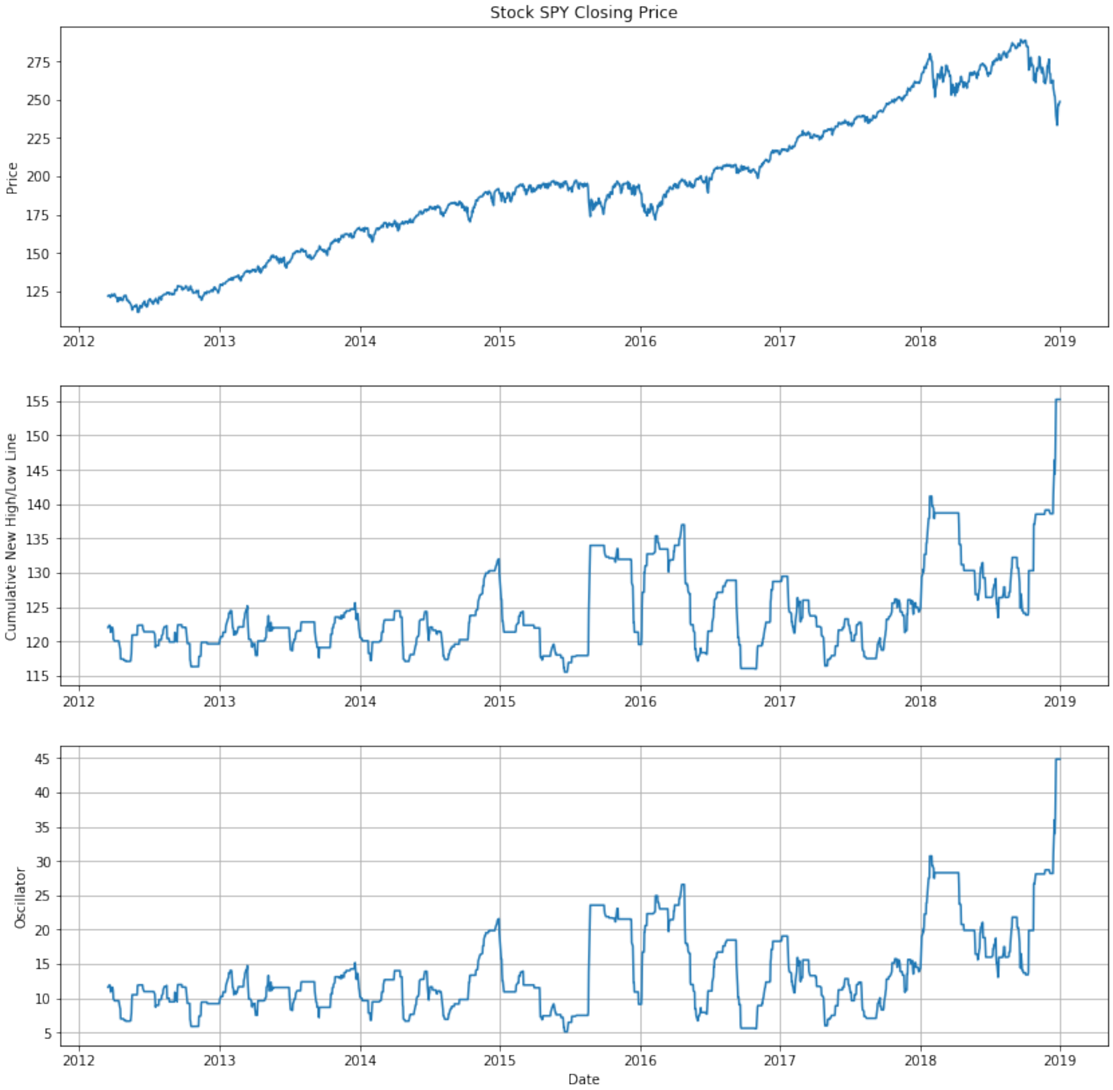
[12]:

```
                  Open        High         Low       Close   Adj Close  \
Date
2012-03-16  140.360001  140.479996  140.000000  140.300003  121.843971
2012-03-19  140.210007  141.279999  140.110001  140.850006  122.321655
2012-03-20  140.050003  140.610001  139.639999  140.440002  121.965569
2012-03-21  140.520004  140.649994  139.919998  140.210007  121.765793
2012-03-22  139.179993  139.550003  138.740005  139.199997  120.888680
2012-03-23  139.320007  139.809998  138.550003  139.649994  121.279488
2012-03-26  140.649994  141.610001  140.600006  141.610001  122.981621
2012-03-27  141.740005  141.830002  141.080002  141.169998  122.599518
2012-03-28  141.100006  141.320007  139.639999  140.470001  121.991638
2012-03-29  139.639999  140.490005  139.089996  140.229996  121.783188

               Volume        CNHL  Oscillator     Ratio        NH        NL  \
Date
2012-03-16  152893500  122.016899   11.599342  1.105215  0.524989  0.524989
2012-03-19  125291100  122.321655   11.904098  1.107810  0.525574  0.525574
2012-03-20  121729700  122.313004   11.895447  1.107723  0.525554  0.525554
2012-03-21  122388400  122.313004   11.895447  1.107723  0.525554  0.525554
2012-03-22  135216700  122.044952   11.627395  1.105041  0.524950  0.524950
2012-03-23  120521000  121.335937   10.918380  1.098008  0.523357  0.523357
2012-03-26  120164000  121.995903   11.578346  1.103932  0.524699  0.524699
2012-03-27  119868500  121.995903   11.578346  1.103932  0.524699  0.524699
2012-03-28  148562100  121.995903   11.578346  1.103932  0.524699  0.524699
```

```
2012-03-29  164963700  121.563546   11.145989  1.099664  0.523733  0.523733

                 NHTM       NLTM
Date
2012-03-16  24.368794  22.048926
2012-03-19  24.464331  22.083511
2012-03-20  24.464331  22.085242
2012-03-21  24.464331  22.085242
2012-03-22  24.464331  22.138852
2012-03-23  24.464331  22.280655
2012-03-26  24.596324  22.280655
2012-03-27  24.596324  22.280655
2012-03-28  24.596324  22.280655
2012-03-29  24.596324  22.367126
```

[13]:

```python
fig = plt.figure(figsize=(14,14))
ax1 = plt.subplot(3, 1, 1)
ax1.plot(df['Adj Close'])
ax1.set_title('Stock '+ symbol +' Closing Price')
ax1.set_ylabel('Price')

ax2 = plt.subplot(3, 1, 2)
ax2.plot(df['CNHL'], label='Cumulative New High/Low Line')
#ax2.axhline(y=0, color='red')
ax2.set_ylabel('Cumulative New High/Low Line')
ax2.grid()

ax3 = plt.subplot(3, 1, 3)
ax3.plot(df['Oscillator'], label='Oscillator')
#ax3.axhline(y=50, color='red')
ax3.set_ylabel('Oscillator')
ax3.set_xlabel('Date')
ax3.grid()
```



1.2 Candlestick with New Highs/New Lows

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

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

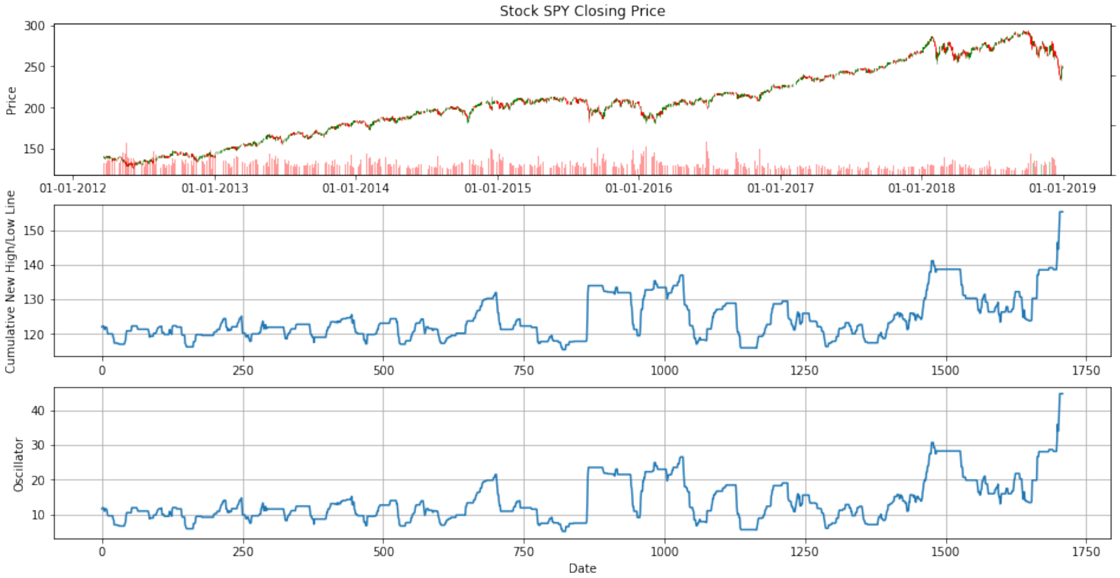
```
[14]:         Date        Open        High         Low       Close   Adj Close  \
      0  734578.0  140.360001  140.479996  140.000000  140.300003  121.843971
```

```
1  734581.0  140.210007  141.279999  140.110001  140.850006  122.321655
2  734582.0  140.050003  140.610001  139.639999  140.440002  121.965569
3  734583.0  140.520004  140.649994  139.919998  140.210007  121.765793
4  734584.0  139.179993  139.550003  138.740005  139.199997  120.888680

      Volume        CNHL  Oscillator     Ratio        NH        NL       NHTM  \
0  152893500  122.016899   11.599342  1.105215  0.524989  0.524989  24.368794
1  125291100  122.321655   11.904098  1.107810  0.525574  0.525574  24.464331
2  121729700  122.313004   11.895447  1.107723  0.525554  0.525554  24.464331
3  122388400  122.313004   11.895447  1.107723  0.525554  0.525554  24.464331
4  135216700  122.044952   11.627395  1.105041  0.524950  0.524950  24.464331

        NLTM  VolumePositive
0  22.048926           False
1  22.083511           False
2  22.085242           False
3  22.085242           False
4  22.138852           False
```

[15]:

```
from mpl_finance import candlestick_ohlc

fig = plt.figure(figsize=(16,8))
ax1 = plt.subplot(3, 1, 1)
candlestick_ohlc(ax1,df.values, width=0.5, colorup='g', colordown='r', alpha=1.
 ↪0)
ax1.xaxis_date()
ax1.xaxis.set_major_formatter(mdates.DateFormatter('%d-%m-%Y'))
ax1v = ax1.twinx()
colors = df.VolumePositive.map({True: 'g', False: 'r'})
ax1v.bar(df.Date, df['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(3, 1, 2)
ax2.plot(df['CNHL'], label='Cumulative New High/Low Line')
#ax2.axhline(y=0, color='red')
ax2.grid()
ax2.set_ylabel('Cumulative New High/Low Line')

ax3 = plt.subplot(3, 1, 3)
ax3.plot(df['Oscillator'], label='Oscillator')
#ax3.axhline(y=50, color='red')
ax3.grid()
ax3.set_ylabel('Oscillator')
ax3.set_xlabel('Date')
```

```
[15]: Text(0.5,0,'Date')
```


Stock SPY Closing Price
Price
Cumulative New High/Low Line
Oscillator
Date