Elder_Force_Index

September 29, 2021

1 Elder Force Index (EFI)

https://library.tradingtechnologies.com/trade/chrt-ti-elder-force-index.html

[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 = '2018-08-01'
end = '2018-12-31'

# 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	Volume
2018-08-01	199.130005	201.759995	197.309998	201.500000	198.478760	
2018-08-02	200.580002	208.380005	200.350006	207.389999	204.280457	
2018-08-03	207.029999	208.740005	205.479996	207.990005	204.871445	
2018-08-06	208.000000	209.250000	207.070007	209.070007	205.935257	
2018-08-07	209.320007	209.500000	206.759995	207.110001	204.004639	

```
2018-08-01  67935700
2018-08-02  62404000
2018-08-03  33447400
2018-08-06  25425400
2018-08-07  25587400
```

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

[3]:
```
                 Open        High         Low       Close   Adj Close  \
Date
2018-12-24  148.149994  151.550003  146.589996  146.830002  145.642090
2018-12-26  148.300003  157.229996  146.720001  157.169998  155.898438
2018-12-27  155.839996  156.770004  150.070007  156.149994  154.886688
2018-12-28  157.500000  158.520004  154.550003  156.229996  154.966034
2018-12-31  158.529999  159.360001  156.479996  157.740005  156.463837

               Volume
Date
2018-12-24  37169200
2018-12-26  58582500
2018-12-27  53117100
2018-12-28  42291400
2018-12-31  35003500
```

[4]:
```
n = 14
df['EMA'] = df['Adj Close'].
 ↪ewm(ignore_na=False,span=n,min_periods=n,adjust=True).mean()
```

[5]:
```
EFI = df['Adj Close'] - df['Adj Close'].shift() * df['Volume']
```

[6]:
```
df['EFI'] = EFI.ewm(ignore_na=False,span=n,min_periods=n,adjust=True).mean()
```

[7]:
```
df.head(20)
```

[7]:
```
                 Open        High         Low       Close   Adj Close  \
Date
2018-08-01  199.130005  201.759995  197.309998  201.500000  198.478760
2018-08-02  200.580002  208.380005  200.350006  207.389999  204.280457
2018-08-03  207.029999  208.740005  205.479996  207.990005  204.871445
2018-08-06  208.000000  209.250000  207.070007  209.070007  205.935257
2018-08-07  209.320007  209.500000  206.759995  207.110001  204.004639
2018-08-08  206.050003  207.809998  204.520004  207.250000  204.142532
2018-08-09  207.279999  209.779999  207.199997  208.880005  205.748108
2018-08-10  207.360001  209.100006  206.669998  207.529999  205.135254
2018-08-13  207.699997  210.949997  207.699997  208.869995  206.459793
2018-08-14  210.160004  210.559998  208.259995  209.750000  207.329651
2018-08-15  209.220001  210.740005  208.330002  210.240005  207.813995
```

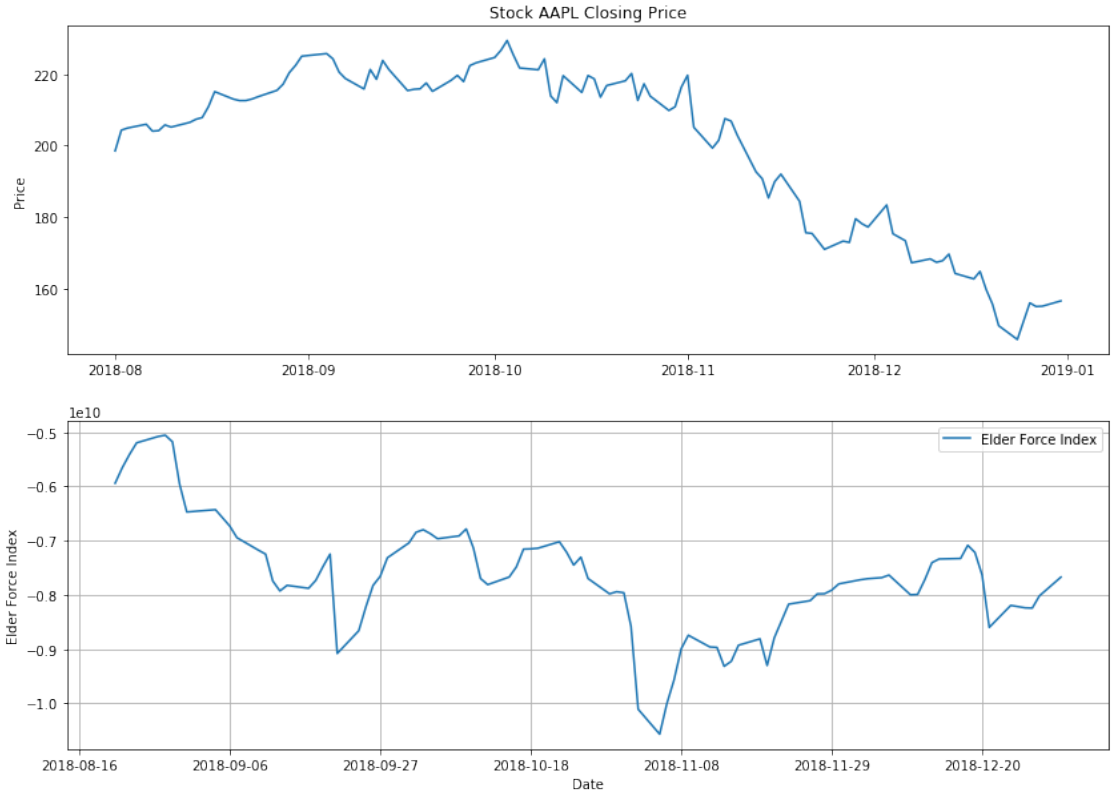
```
2018-08-16  211.750000  213.809998  211.470001  213.320007  210.858459
2018-08-17  213.440002  217.949997  213.160004  217.580002  215.069290
2018-08-20  218.100006  219.179993  215.110001  215.460007  212.973755
2018-08-21  216.800003  217.190002  214.029999  215.039993  212.558609
2018-08-22  214.100006  216.360001  213.839996  215.050003  212.568481
2018-08-23  214.649994  217.050003  214.600006  215.490005  213.003418
2018-08-24  216.600006  216.899994  215.110001  216.160004  213.665680
2018-08-27  217.149994  218.740005  216.330002  217.940002  215.425140
2018-08-28  219.009995  220.539993  218.919998  219.699997  217.164825

               Volume         EMA           EFI
Date
2018-08-01  67935700         NaN           NaN
2018-08-02  62404000         NaN           NaN
2018-08-03  33447400         NaN           NaN
2018-08-06  25425400         NaN           NaN
2018-08-07  25587400         NaN           NaN
2018-08-08  22525500         NaN           NaN
2018-08-09  23469200         NaN           NaN
2018-08-10  24611200         NaN           NaN
2018-08-13  25869100         NaN           NaN
2018-08-14  20748000         NaN           NaN
2018-08-15  28807600         NaN           NaN
2018-08-16  28500400         NaN           NaN
2018-08-17  35427000         NaN           NaN
2018-08-20  30287700  208.667778           NaN
2018-08-21  26159800  209.255222 -5.940029e+09
2018-08-22  19018100  209.746788 -5.653531e+09
2018-08-23  18883200  210.222798 -5.410281e+09
2018-08-24  18476400  210.719656 -5.194722e+09
2018-08-27  20525100  211.391350 -5.077941e+09
2018-08-28  22776800  212.207810 -5.053496e+09
```

[8]:
```
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.index, df['EFI'], label='Elder Force Index')
ax2.grid()
ax2.set_ylabel('Elder Force Index')
ax2.set_xlabel('Date')
ax2.legend(loc='best')
```

[8]:
```
<matplotlib.legend.Legend at 0x2968b157278>
```



1.1 Candlestick with Elder Force Index

[9]:
```
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()
```

[9]:

	Date	Open	High	Low	Close	Adj Close	Volume	EMA	EFI	VolumePositive
0	736907.0	199.130005	201.759995	197.309998	201.500000	198.478760	67935700	NaN	NaN	False
1	736908.0	200.580002	208.380005	200.350006	207.389999	204.280457				
2	736909.0	207.029999	208.740005	205.479996	207.990005	204.871445				
3	736912.0	208.000000	209.250000	207.070007	209.070007	205.935257				
4	736913.0	209.320007	209.500000	206.759995	207.110001	204.004639				

```
1  62404000  NaN  NaN            True
2  33447400  NaN  NaN           False
3  25425400  NaN  NaN           False
4  25587400  NaN  NaN           False
```

[10]:
```
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.index, df['EFI'], label='Elder Force Index')
ax2.grid()
ax2.set_ylabel('Elder Force Index')
ax2.set_xlabel('Date')
ax2.legend(loc='best')
```

[10]:
```
<matplotlib.legend.Legend at 0x2968b382cc0>
```


Stock AAPL Closing Price
Price
220
200
180
160
01-08-2018
01-09-2018
01-10-2018
01-11-2018
01-12-2018
01-01-2019

1e10
Elder Force Index
−0.5
−0.6
−0.7
−0.8
−0.9
−1.0
2018-08-16
2018-09-06
2018-09-27
2018-10-18
2018-11-08
2018-11-29
2018-12-20
Date