Vortex_Indicator

September 29, 2021

1 Vortex Indicator

https://stockcharts.com/school/doku.php?id=chart_school:technical_indicators:vortex_indicator

[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 = '2017-01-01'
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	Volume
2017-01-03	115.800003	116.330002	114.760002	116.150002	112.140007	
2017-01-04	115.849998	116.510002	115.750000	116.019997	112.014503	
2017-01-05	115.919998	116.860001	115.809998	116.610001	112.584129	
2017-01-06	116.779999	118.160004	116.470001	117.910004	113.839249	
2017-01-09	117.949997	119.430000	117.940002	118.989998	114.881950	

```
2017-01-03  28781900
2017-01-04  21118100
2017-01-05  22193600
2017-01-06  31751900
2017-01-09  33561900
```

[3]:
```
n = 14 # Number of days
df['Prior Low'] = df['Low'].shift()
df['Prior High'] = df['High'].shift()
df['+VM'] = abs(df['High'] - df['Prior Low'])
df['-VM'] = abs(df['Low'] - df['Prior High'])
df['+VM_'+str(n)] = df['+VM'].rolling(n).sum()
df['-VM_'+str(n)] = df['-VM'].rolling(n).sum()
df['HL'] = df['High'] - df['Low']
df['HC'] = abs(df['High'] - df['Adj Close'].shift())
df['LC'] = abs(df['Low'] -df['Adj Close'].shift())
df['TR'] = df[['HL','HC','LC']].max(axis=1)
```

[4]:
```
df.tail()
```

[4]:

Date	Open	High	Low	Close	Adj Close	Volume	Prior Low	Prior High	+VM	-VM	+VM_14	-VM_14	HL	HC	LC	TR
2018-12-24	148.149994	151.550003	146.589996	146.830002	146.202972	37169200	149.630005	158.160004	1.919998	11.570008	44.660002	108.750000	4.960007	1.463699	3.496308	4.960007
2018-12-26	148.300003	157.229996	146.720001	157.169998	156.498810	58582500	146.589996	151.550003	10.640000	4.830002	54.120010	104.910004	10.509995	11.027024	0.517029	11.027024
2018-12-27	155.839996	156.770004	150.070007	156.149994	155.483154	53117100	146.720001	157.229996	10.050003	7.159989	62.680008	100.099992	6.699997	0.271194	6.428803	6.699997
2018-12-28	157.500000	158.520004	154.550003	156.229996	155.562820	42291400	150.070007	156.770004	8.449997	2.220001	67.059998	95.839997	3.970001	3.036850	0.933151	3.970001
2018-12-31	158.529999	159.360001	156.479996	157.740005	157.066376	35003500	154.550003	158.520004	4.809998	2.040008	70.080003	86.720002	2.880005	3.797181	0.917176	3.797181

[5]:
```
del df['HL']
del df['HC']
del df['LC']
```

[6]:
```
df['TR_'+str(n)] = df['TR'].rolling(n).sum()
df['+VI_'+str(n)] = df['+VM_'+str(n)]/df['TR_'+str(n)]
df['-VI_'+str(n)] = df['-VM_'+str(n)]/df['TR_'+str(n)]
```

[7]:
```
df = df.drop(['Prior Low','Prior␣
↪High','+VM','-VM','+VM_14','-VM_14','TR','TR_14'],axis=1)
```

[8]:
```
df.head(30)
```

[8]:

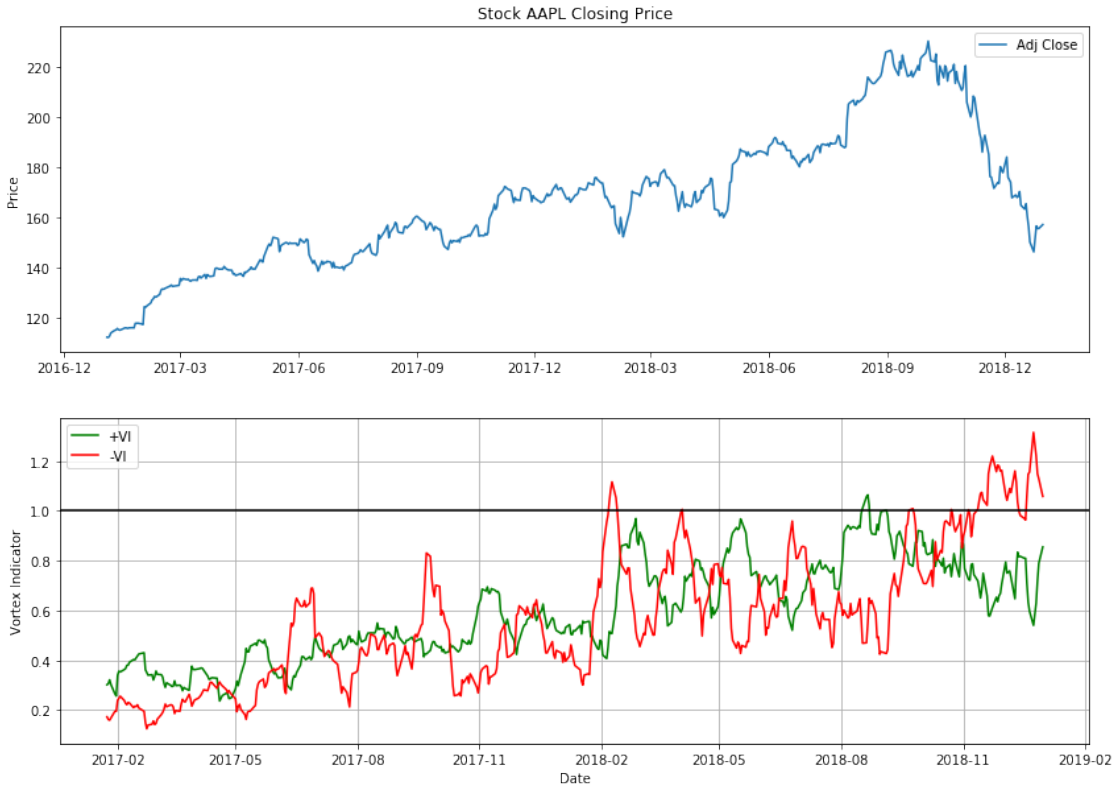
Date	Open	High	Low	Close	Adj Close	Volume	+VI_14	-VI_14
2017-01-03	115.800003	116.330002	114.760002	116.150002	112.140007	28781900	NaN	NaN
2017-01-04	115.849998	116.510002	115.750000	116.019997	112.014503	21118100	NaN	NaN
2017-01-05	115.919998	116.860001	115.809998	116.610001	112.584129	22193600	NaN	NaN
2017-01-06	116.779999	118.160004	116.470001	117.910004	113.839249			
2017-01-09	117.949997	119.430000	117.940002	118.989998	114.881950			
2017-01-10	118.769997	119.379997	118.300003	119.110001	114.997818			
2017-01-11	118.739998	119.930000	118.599998	119.750000	115.615723			
2017-01-12	118.900002	119.300003	118.209999	119.250000	115.132988			
2017-01-13	119.110001	119.620003	118.809998	119.040001	114.930237			
2017-01-17	118.339996	120.239998	118.220001	120.000000	115.857086			
2017-01-18	120.000000	120.500000	119.709999	119.989998	115.847435			
2017-01-19	119.400002	120.089996	119.370003	119.779999	115.644691			
2017-01-20	120.449997	120.449997	119.730003	120.000000	115.857086			
2017-01-23	120.000000	120.809998	119.769997	120.080002	115.934326			
2017-01-24	119.550003	120.099998	119.500000	119.970001	115.828125			
2017-01-25	120.419998	122.099998	120.279999	121.879997	117.672188			
2017-01-26	121.669998	122.440002	121.599998	121.940002	117.730118			
2017-01-27	122.139999	122.349998	121.599998	121.949997	117.739769			
2017-01-30	120.930000	121.629997	120.660004	121.629997	117.430817			
2017-01-31	121.150002	121.389999	120.620003	121.349998	117.160492			
2017-02-01	127.029999	130.490005	127.010002	128.750000	124.305000			
2017-02-02	127.980003	129.389999	127.779999	128.529999	124.092606			
2017-02-03	128.309998	129.190002	128.160004	129.080002	124.623619			
2017-02-06	129.130005	130.500000	128.899994	130.289993	125.791840			
2017-02-07	130.539993	132.089996	130.449997	131.529999	126.989029			
2017-02-08	131.350006	132.220001	131.220001	132.039993	127.481415			
2017-02-09	131.649994	132.449997	131.119995	132.419998	128.402603			
2017-02-10	132.460007	132.940002	132.050003	132.119995	128.111710			
2017-02-13	133.080002	133.820007	132.750000	133.289993	129.246201			
2017-02-14	133.470001	135.089996	133.250000	135.020004	130.923721			

```
2017-01-06   31751900       NaN       NaN
2017-01-09   33561900       NaN       NaN
2017-01-10   24462100       NaN       NaN
2017-01-11   27588600       NaN       NaN
2017-01-12   27086200       NaN       NaN
2017-01-13   26111900       NaN       NaN
2017-01-17   34439800       NaN       NaN
2017-01-18   23713000       NaN       NaN
2017-01-19   25597300       NaN       NaN
2017-01-20   32597900       NaN       NaN
2017-01-23   22050200       NaN       NaN
2017-01-24   23211000  0.301500  0.172761
2017-01-25   32377600  0.305567  0.162048
2017-01-26   26337600  0.321374  0.159289
2017-01-27   20562900  0.302071  0.168282
2017-01-30   30377500  0.265051  0.195188
2017-01-31   49201000  0.256289  0.194959
2017-02-01  111985000  0.339537  0.238756
2017-02-02   33710400  0.355697  0.247552
2017-02-03   24507300  0.352808  0.255390
2017-02-06   26845900  0.362187  0.238816
2017-02-07   38183800  0.366201  0.227502
2017-02-08   23004100  0.379322  0.221314
2017-02-09   28349900  0.380444  0.230279
2017-02-10   20065500  0.391943  0.227919
2017-02-13   23035400  0.402433  0.209441
2017-02-14   33226200  0.401325  0.215496
```

[9]:
```
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')
ax1.legend(loc='best')

ax2 = plt.subplot(2, 1, 2)
ax2.plot(df['+VI_14'], label='+VI', color='g')
ax2.plot(df['-VI_14'], label='-VI', color='r')
ax2.axhline(y=1, color='black')
ax2.grid()
ax2.legend(loc='best')
ax2.set_ylabel('Vortex Indicator')
ax2.set_xlabel('Date')
```

[9]:
```
Text(0.5,0,'Date')
```



1.1 Candlestick with Vortex Indicator

[10]:
```
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()
```

[10]:

	Date	Open	High	Low	Close	Adj Close	Volume	+VI_14	-VI_14	VolumePositive
0	736332.0	115.800003	116.330002	114.760002	116.150002	112.140007	28781900	NaN	NaN	False
1	736333.0	115.849998	116.510002	115.750000	116.019997	112.014503	21118100	NaN	NaN	False
2	736334.0	115.919998	116.860001	115.809998	116.610001	112.584129				
3	736335.0	116.779999	118.160004	116.470001	117.910004	113.839249				
4	736338.0	117.949997	119.430000	117.940002	118.989998	114.881950				

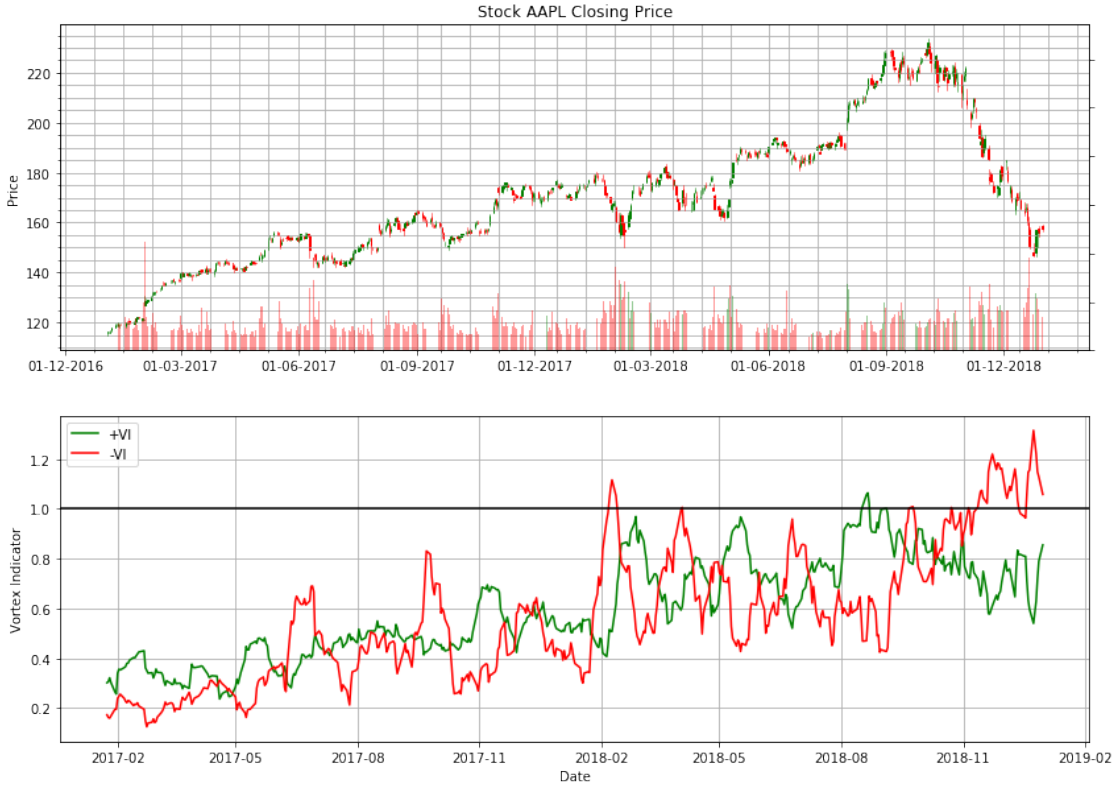
```
2  22193600     NaN     NaN          False
3  31751900     NaN     NaN          False
4  33561900     NaN     NaN          False
```

[11]:
```
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['+VI_14'], label='+VI', color='g')
ax2.plot(df['-VI_14'], label='-VI', color='r')
ax2.axhline(y=1, color='black')
ax2.grid()
ax2.legend(loc='best')
ax2.set_ylabel('Vortex Indicator')
ax2.set_xlabel('Date')
```

[11]:
```
Text(0.5,0,'Date')
```


Stock AAPL Closing Price
Price
220
200
180
160
140
120
01-12-2016
01-03-2017
01-06-2017
01-09-2017
01-12-2017
01-03-2018
01-06-2018
01-09-2018
01-12-2018
+VI
-VI
Vortex Indicator
1.2
1.0
0.8
0.6
0.4
0.2
2017-02
2017-05
2017-08
2017-11
2018-02
2018-05
2018-08
2018-11
2019-02
Date