RRI

September 29, 2021

1 Real Range Indicator

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

import warnings
warnings.filterwarnings("ignore")

# yahoo finance is used to fetch data
import yfinance as yf
yf.pdr_override()
```

[2]:
```
# input
symbol = 'AAPL'
start = '2018-08-01'
end = '2019-01-01'

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

# View Columns
df.head()
```

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

[2]:

Date	Open	High	Low	Close	Adj Close	Volume
2018-08-01	49.782501	50.439999	49.327499	50.375000	48.706295	271742800
2018-08-02	50.145000	52.095001	50.087502	51.847500	50.130024	249616000
2018-08-03	51.757500	52.185001	51.369999	51.997501	50.275055	133789600
2018-08-06	52.000000	52.312500	51.767502	52.267502	50.536114	101701600
2018-08-07	52.330002	52.375000	51.689999	51.777500	50.062340	102349600

[3]:
```
df['RRI'] = (df['Adj Close'] - df['Open']) / (df['High'] - df['Low'])
```

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

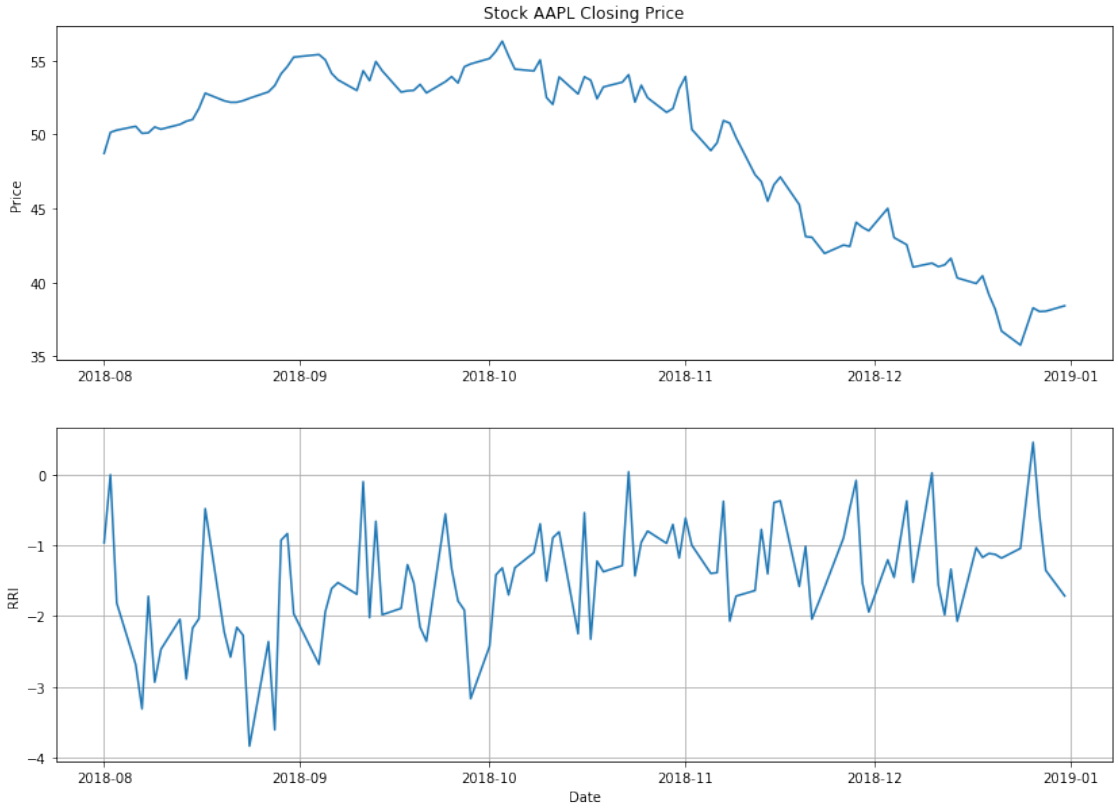
[4]:
```
                 Open       High        Low      Close  Adj Close     Volume  \
Date
2018-08-01  49.782501  50.439999  49.327499  50.375000  48.706295  271742800
2018-08-02  50.145000  52.095001  50.087502  51.847500  50.130024  249616000
2018-08-03  51.757500  52.185001  51.369999  51.997501  50.275055  133789600
2018-08-06  52.000000  52.312500  51.767502  52.267502  50.536114  101701600
2018-08-07  52.330002  52.375000  51.689999  51.777500  50.062340  102349600

                 RRI
Date
2018-08-01 -0.967377
2018-08-02 -0.007460
2018-08-03 -1.818945
2018-08-06 -2.686039
2018-08-07 -3.310449
```

[5]:
```
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['RRI'], label='Real Range Indicator')
ax2.grid()
ax2.set_ylabel('RRI')
ax2.set_xlabel('Date')
```

[5]:
```
Text(0.5, 0, 'Date')
```



1.1 Candlestick with RRI

[6]:
```
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'] = pd.to_datetime(dfc['Date'])
dfc['Date'] = dfc['Date'].apply(mdates.date2num)
dfc.head()
```

[6]:

	Date	Open	High	Low	Close	Adj Close	Volume	\
0	17744.0	49.782501	50.439999	49.327499	50.375000	48.706295	271742800	
1	17745.0	50.145000	52.095001	50.087502	51.847500	50.130024	249616000	
2	17746.0	51.757500	52.185001	51.369999	51.997501	50.275055	133789600	
3	17749.0	52.000000	52.312500	51.767502	52.267502	50.536114	101701600	
4	17750.0	52.330002	52.375000	51.689999	51.777500	50.062340	102349600	

	RRI	VolumePositive

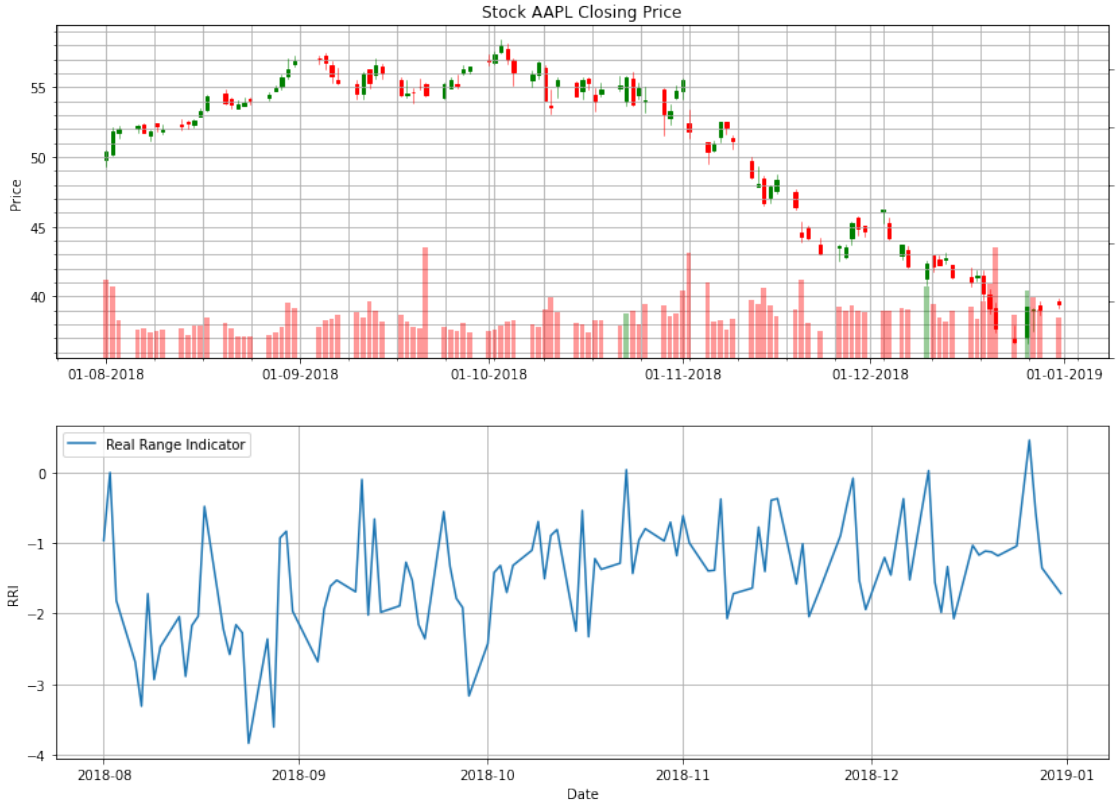
```
0 -0.967377          False
1 -0.007460          False
2 -1.818945          False
3 -2.686039          False
4 -3.310449          False
```

[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 = plt.subplot(2, 1, 2)
ax2.plot(df['RRI'], label='Real Range Indicator')
ax2.grid()
ax2.set_ylabel('RRI')
ax2.set_xlabel('Date')
ax2.legend(loc='best')
```

[11]:
```
<matplotlib.legend.Legend at 0x20ec4880cf8>
```


Stock AAPL Closing Price
Price
55
50
45
40
01-08-2018
01-09-2018
01-10-2018
01-11-2018
01-12-2018
01-01-2019
Real Range Indicator
RRI
0
−1
−2
−3
−4
2018-08
2018-09
2018-10
2018-11
2018-12
2019-01
Date