Stochastic_RSI

September 29, 2021

1 Stochastic RSI (STOCH RSI)

https://www.tradingview.com/wiki/Stochastic_RSI_(STOCH_RSI)#CALCULATION

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

[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 = '2018-06-01'
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
2018-06-01	187.990005	190.259995	187.750000	190.240005	188.109222
2018-06-04	191.639999	193.419998	191.350006	191.830002	189.681396
2018-06-05	193.070007	193.940002	192.360001	193.309998	191.144821
2018-06-06	193.630005	194.080002	191.919998	193.979996	191.807312
2018-06-07	194.139999	194.199997	192.339996	193.460007	191.293152

```
              Volume
Date
2018-06-01  23442500
2018-06-04  26266200
2018-06-05  21566000
2018-06-06  20933600
2018-06-07  21347200
```

[3]:
```
import talib as ta

df['RSI'] = ta.RSI(df['Adj Close'], timeperiod=14)
df.head(10)
```

[3]:
```
                 Open        High         Low       Close   Adj Close  \
Date
2018-06-01  187.990005  190.259995  187.750000  190.240005  188.109222
2018-06-04  191.639999  193.419998  191.350006  191.830002  189.681396
2018-06-05  193.070007  193.940002  192.360001  193.309998  191.144821
2018-06-06  193.630005  194.080002  191.919998  193.979996  191.807312
2018-06-07  194.139999  194.199997  192.339996  193.460007  191.293152
2018-06-08  191.169998  192.000000  189.770004  191.699997  189.552856
2018-06-11  191.350006  191.970001  190.210007  191.229996  189.088135
2018-06-12  191.389999  192.610001  191.149994  192.279999  190.126358
2018-06-13  192.419998  192.880005  190.440002  190.699997  188.564056
2018-06-14  191.550003  191.570007  190.220001  190.800003  188.662933

              Volume  RSI
Date
2018-06-01  23442500  NaN
2018-06-04  26266200  NaN
2018-06-05  21566000  NaN
2018-06-06  20933600  NaN
2018-06-07  21347200  NaN
2018-06-08  26656800  NaN
2018-06-11  18308500  NaN
2018-06-12  16911100  NaN
2018-06-13  21638400  NaN
2018-06-14  21610100  NaN
```

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

[4]:
```
                 Open        High         Low       Close   Adj Close  \
Date
2018-06-21  187.250000  188.350006  184.940002  185.460007  183.382751
2018-06-22  186.119995  186.149994  184.699997  184.919998  182.848785
2018-06-25  183.399994  184.919998  180.729996  182.169998  180.129608
```

```
2018-06-26  182.990005  186.529999  182.539993  184.429993  182.364288
2018-06-27  185.229996  187.279999  184.029999  184.160004  182.097321

               Volume        RSI
Date
2018-06-21  25711900  35.228595
2018-06-22  27200400  34.006310
2018-06-25  31663100  28.570086
2018-06-26  24569200  37.423516
2018-06-27  25285300  36.836118
```

[5]:
```
LL_RSI = df['RSI'].rolling(14).min()
HH_RSI = df['RSI'].rolling(14).max()
```

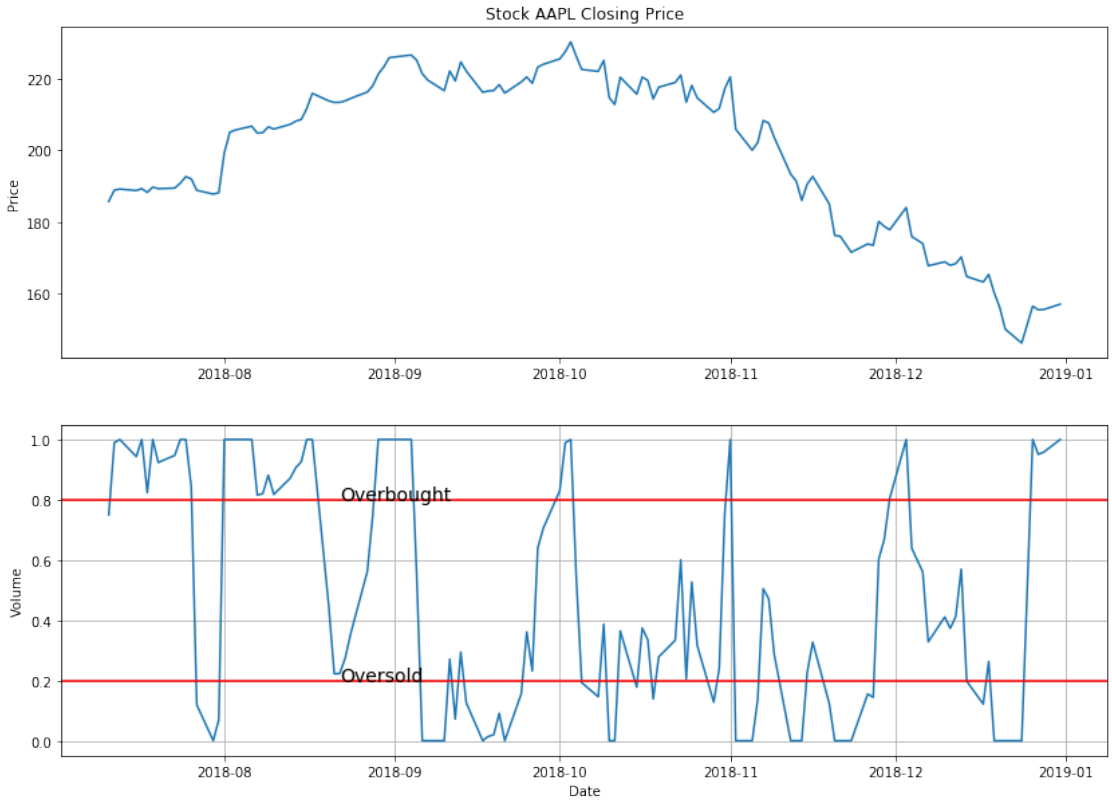
[6]:
```
df['Stoch_RSI'] = (df['RSI'] - LL_RSI) / (HH_RSI - LL_RSI)
df = df.dropna()
df.head(10)
```

[6]:
```
                 Open        High         Low       Close   Adj Close  \
Date
2018-07-11  188.500000  189.779999  187.610001  187.880005  185.775650
2018-07-12  189.529999  191.410004  189.309998  191.029999  188.890366
2018-07-13  191.080002  191.839996  190.899994  191.330002  189.187012
2018-07-16  191.520004  192.649994  190.419998  190.910004  188.771713
2018-07-17  189.750000  191.869995  189.199997  191.449997  189.305664
2018-07-18  191.779999  191.800003  189.929993  190.399994  188.267410
2018-07-19  189.690002  192.550003  189.690002  191.880005  189.730850
2018-07-20  191.779999  192.429993  190.169998  191.440002  189.295776
2018-07-23  190.679993  191.960007  189.559998  191.610001  189.463867
2018-07-24  192.449997  193.660004  192.050003  193.000000  190.838303

               Volume        RSI  Stoch_RSI
Date
2018-07-11  18831500  49.966019   0.749868
2018-07-12  18041100  56.792525   0.989118
2018-07-13  12513900  57.388821   1.000000
2018-07-16  15043100  56.219069   0.943085
2018-07-17  15534500  57.420751   1.000000
2018-07-18  16393400  54.299782   0.823262
2018-07-19  20286800  57.782876   1.000000
2018-07-20  20676200  56.406463   0.923621
2018-07-23  15989400  56.834277   0.947361
2018-07-24  18697900  60.267799   1.000000
```

[7]:
```
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['Stoch_RSI'], label='Stoch RSI')
ax2.text(s='Overbought', x=df.RSI.index[30], y=0.8, fontsize=14)
ax2.text(s='Oversold', x=df.RSI.index[30], y=0.2, fontsize=14)
ax2.axhline(y=0.8, color='red')
ax2.axhline(y=0.2, color='red')
ax2.grid()
ax2.set_ylabel('Volume')
ax2.set_xlabel('Date')
```

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



1.1 Candlestick with Stoch RSI

[8]:
```
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()
```

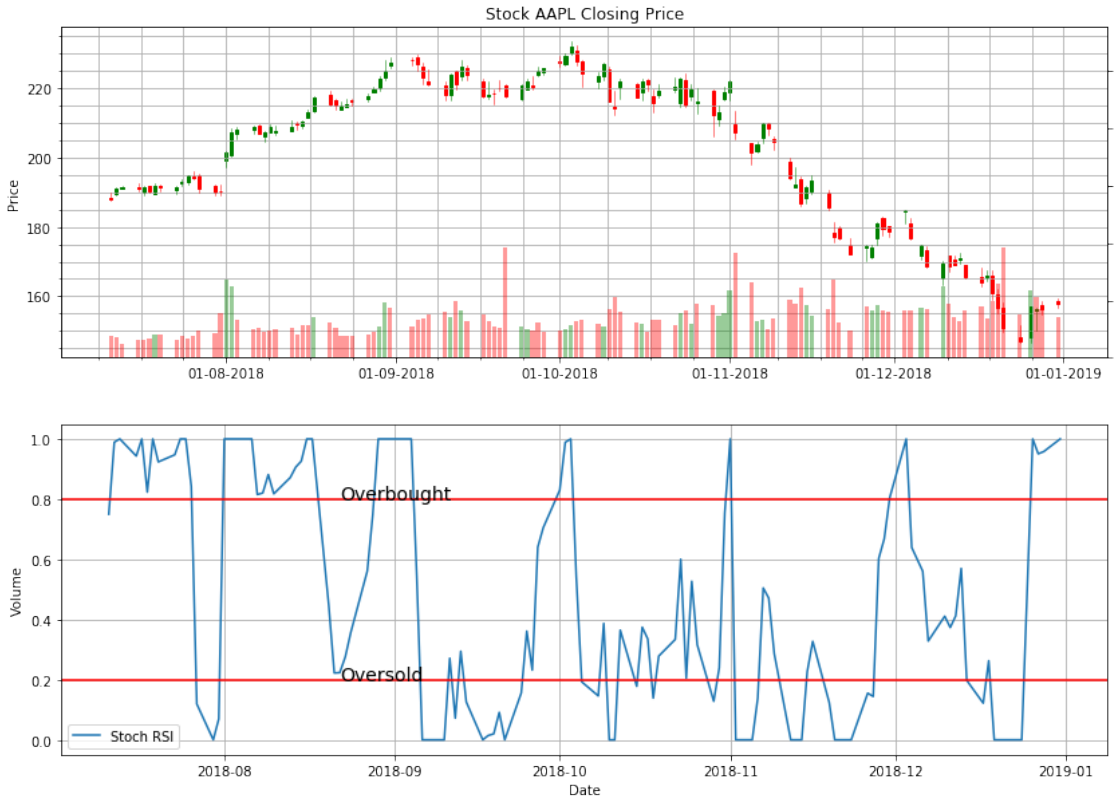
[8]:

	Date	Open	High	Low	Close	Adj Close	Volume	RSI	Stoch_RSI	VolumePositive
0	736886.0	188.500000	189.779999	187.610001	187.880005	185.775650	18831500	49.966019	0.749868	False
1	736887.0	189.529999	191.410004	189.309998	191.029999	188.890366	18041100	56.792525	0.989118	False
2	736888.0	191.080002	191.839996	190.899994	191.330002	189.187012	12513900	57.388821	1.000000	False
3	736891.0	191.520004	192.649994	190.419998	190.910004	188.771713	15043100	56.219069	0.943085	False
4	736892.0	189.750000	191.869995	189.199997	191.449997	189.305664	15534500	57.420751	1.000000	False

[9]:
```
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['Stoch_RSI'], label='Stoch RSI')
ax2.text(s='Overbought', x=df.RSI.index[30], y=0.8, fontsize=14)
ax2.text(s='Oversold', x=df.RSI.index[30], y=0.2, fontsize=14)
ax2.axhline(y=0.8, color='red')
ax2.axhline(y=0.2, color='red')
ax2.grid()
ax2.set_ylabel('Volume')
ax2.set_xlabel('Date')
```

```
ax2.legend(loc='best')
```

[9]: <matplotlib.legend.Legend at 0x22dd86b5048>



[14]:
```
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['Stoch_RSI'], label='Stoch RSI')
ax2.text(s='Overbought', x=df.RSI.index[30], y=0.8, fontsize=14)
ax2.text(s='Oversold', x=df.RSI.index[30], y=0.2, fontsize=14)
ax2.fill_between(df.index, y1=0.2, y2=0.8, color='#adccff', alpha='0.3')
ax2.axhline(y=0.8, color='red')
ax2.axhline(y=0.2, color='red')
ax2.grid(True, which='both')
ax2.minorticks_on()
ax2.set_ylabel('Volume')
ax2.set_xlabel('Date')
ax2.legend(loc='best')
```

[14]: <matplotlib.legend.Legend at 0x22ddc0faef0>