RSI_BollingerBands

September 29, 2021

1 RSI & Bollinger Bands Strategy

[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()
```

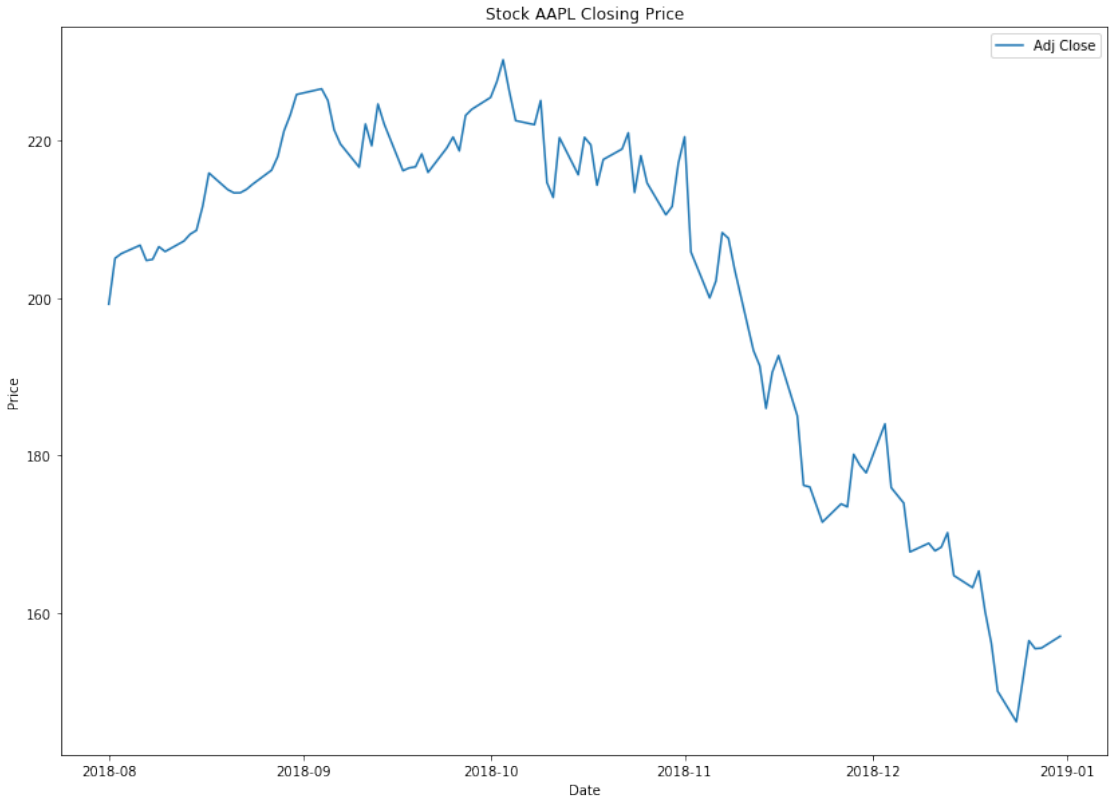
```
[**********************100%**********************]  1 of 1 downloaded
```

[2]:

Date	Open	High	Low	Close	Adj Close	Volume
2018-08-01	199.130005	201.759995	197.309998	201.500000	199.243088	67935700
2018-08-02	200.580002	208.380005	200.350006	207.389999	205.067123	
2018-08-03	207.029999	208.740005	205.479996	207.990005	205.660416	
2018-08-06	208.000000	209.250000	207.070007	209.070007	206.728317	
2018-08-07	209.320007	209.500000	206.759995	207.110001	204.790268	

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

[3]:
```
# Simple Line Chart
plt.figure(figsize=(14,10))
plt.plot(df['Adj Close'])
plt.legend(loc='best')
plt.title('Stock '+ symbol +' Closing Price')
plt.xlabel('Date')
plt.ylabel('Price')
plt.show()
```



1.1 RSI

[4]:
```
import talib as ta
```

[5]:
```
rsi = ta.RSI(df['Adj Close'], timeperiod=14)
rsi = rsi.dropna()
rsi
```

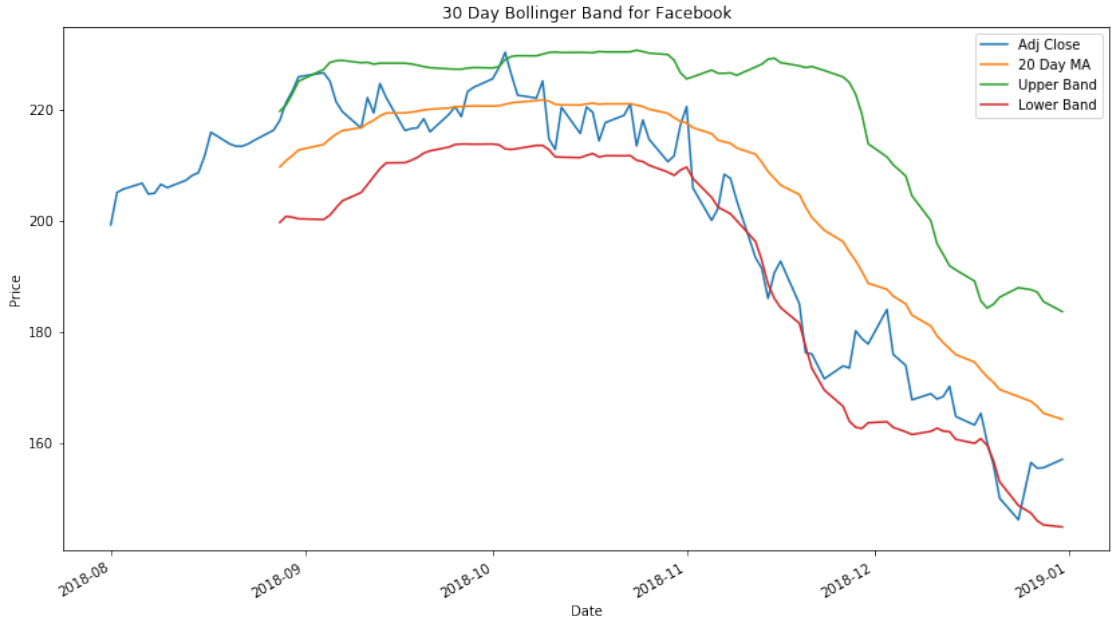
[5]:
Date	
2018-08-21	79.104871
2018-08-22	79.114058
2018-08-23	79.540524
2018-08-24	80.203382
2018-08-27	81.882790
2018-08-28	83.383755
2018-08-29	85.752712
2018-08-30	87.000185
2018-08-31	88.388786
2018-09-04	88.752068
2018-09-05	83.041064
2018-09-06	70.653076
2018-09-07	65.619678
2018-09-10	58.246306
2018-09-11	65.912718
2018-09-12	59.943364
2018-09-13	66.263664
2018-09-14	61.254313
2018-09-17	51.526255
2018-09-18	52.021893
2018-09-19	52.211924
2018-09-20	54.680286
2018-09-21	50.657256
2018-09-24	55.331409
2018-09-25	57.280716
2018-09-26	54.068198
2018-09-27	60.217641
2018-09-28	61.193416
2018-10-01	63.070254
2018-10-02	65.460960
…	…
2018-11-15	35.745552
2018-11-16	38.000323
2018-11-19	33.429692
2018-11-20	29.070172
2018-11-21	28.978513
2018-11-23	26.925899
2018-11-26	29.708364
2018-11-27	29.511006
2018-11-28	37.406645
2018-11-29	36.493364
2018-11-30	35.835839
2018-12-03	42.956272
2018-12-04	37.168867
2018-12-06	35.906482
2018-12-07	32.183810

```
2018-12-10    33.506564
2018-12-11    32.902595
2018-12-12    33.527827
2018-12-13    36.053619
2018-12-14    32.162209
2018-12-17    31.143065
2018-12-18    34.246587
2018-12-19    30.630826
2018-12-20    28.124444
2018-12-21    24.836210
2018-12-24    22.985848
2018-12-26    36.494822
2018-12-27    35.827195
2018-12-28    35.926208
2018-12-31    37.874459
Length: 91, dtype: float64
```

1.2 Bollinger Bands

[6]:
```
# Create Bollinger Band
# https://stockcharts.com/school/doku.php?id=chart_school:technical_indicators:
 ↪bollinger_bands
df['20 Day MA'] = df['Adj Close'].rolling(window=20).mean()
df['20 Day STD'] = df['Adj Close'].rolling(window=20).std()
df['Upper Band'] = df['20 Day MA'] + (df['20 Day STD'] * 2)
df['Lower Band'] = df['20 Day MA'] - (df['20 Day STD'] * 2)
```

[7]:
```
df[['Adj Close', '20 Day MA', 'Upper Band', 'Lower Band']].plot(figsize=(14,8))
plt.title('30 Day Bollinger Band for Facebook')
plt.ylabel('Price')
plt.legend(loc='best')
plt.show()
```



[8]:
```
dfc = df.copy()
dfc = dfc.reset_index()
```

[9]:
```
from matplotlib import dates as mdates
import datetime as dt

dfc['Date'] = mdates.date2num(dfc['Date'].astype(dt.date))
```

[10]:
```
# This one has not date and is convert to number
from mpl_finance import candlestick_ohlc

fig = plt.figure(figsize=(20,10))
ax = plt.subplot(1,1,1)
candlestick_ohlc(ax,dfc.values, width=0.5, colorup='g', colordown='r', alpha=1.
↪0)
plt.title('Candlestick Chart of Stock')
plt.ylabel('Price')
plt.show()
```

[11]:
```
# Plot Candlestick with dates
fig = plt.figure(figsize=(20,10))
ax = plt.subplot(1,1,1)
ax.xaxis_date()
ax.xaxis.set_major_formatter(mdates.DateFormatter('%d-%m-%Y'))
candlestick_ohlc(ax,dfc.values, width=0.5, colorup='g', colordown='r', alpha=1.
 ↪0)
plt.title('Candlestick Chart of Stock')
plt.ylabel('Price')
plt.show()
```

1.3 Combine RSI and Bollinger Bands

[12]:
```
fig = plt.figure(figsize=(20,18))
ax = plt.subplot(2,1,2)
ax.xaxis_date()
ax.xaxis.set_major_formatter(mdates.DateFormatter('%d-%m-%Y'))
plt.plot(df[['20 Day MA', 'Upper Band', 'Lower Band']], label=('20 Day MA',␣
↪'Upper Band', 'Lower Band'))
candlestick_ohlc(ax,dfc.values, width=0.5, colorup='g', colordown='r', alpha=1.
↪0)
plt.title('RSI & Bollinger Bands')
plt.ylabel('Price')

plt.plot(rsi, '-', label='RSI')
plt.text(s='Overbought', x=rsi.index[0], y=80, fontsize=14)
plt.text(s='OverSold', x=rsi.index[0], y=20, fontsize=14)
ax.axhline(y=80,color='r')
ax.axhline(y=20,color='r')
plt.xlabel('Date')
plt.legend(loc='best')
plt.show()
```