Stochastic_Oscillator

September 29, 2021

1 Stochastic Oscillator

https://www.investopedia.com/terms/s/stochasticoscillator.asp

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

import warnings
warnings.filterwarnings("ignore")

import yfinance as yf
yf.pdr_override()
```

[2]:
```
# input
symbol = 'AAPL'
start = '2018-09-01'
end = '2019-01-01'

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

# View Columns
df.head()
```

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

[2]:

Date	Adj Close	Close	High	Low	Open	Volume
2018-09-04	223.062759	228.360001	229.179993	226.630005	228.410004	27390100
2018-09-05	221.607346	226.869995	229.669998	225.100006	228.990005	
2018-09-06	217.924789	223.100006	227.350006	221.300003	226.229996	
2018-09-07	216.166550	221.300003	225.369995	220.710007	221.850006	
2018-09-10	213.265411	218.330002	221.850006	216.470001	220.949997	

```
2018-09-05  33333000
2018-09-06  34290000
2018-09-07  37619800
2018-09-10  39516500
```

[3]:
```
n = 14
smin = df['Low'].rolling(n).min()
smax = df['High'].rolling(n).max()
df['stoch_k'] = 100 * (df['Adj Close'] - smin) / (smax - smin)
d_n = 3
df['stoch_d'] = df['stoch_k'].rolling(d_n).mean()
```

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

[4]:

Date	Adj Close	Close	High	Low	Open	Volume	stoch_k	stoch_d
2018-09-04	223.062759	228.360001	229.179993	226.630005	228.410004	27390100	NaN	NaN
2018-09-05	221.607346	226.869995	229.669998	225.100006	228.990005	33333000	NaN	NaN
2018-09-06	217.924789	223.100006	227.350006	221.300003	226.229996	34290000	NaN	NaN
2018-09-07	216.166550	221.300003	225.369995	220.710007	221.850006	37619800	NaN	NaN
2018-09-10	213.265411	218.330002	221.850006	216.470001	220.949997	39516500	NaN	NaN

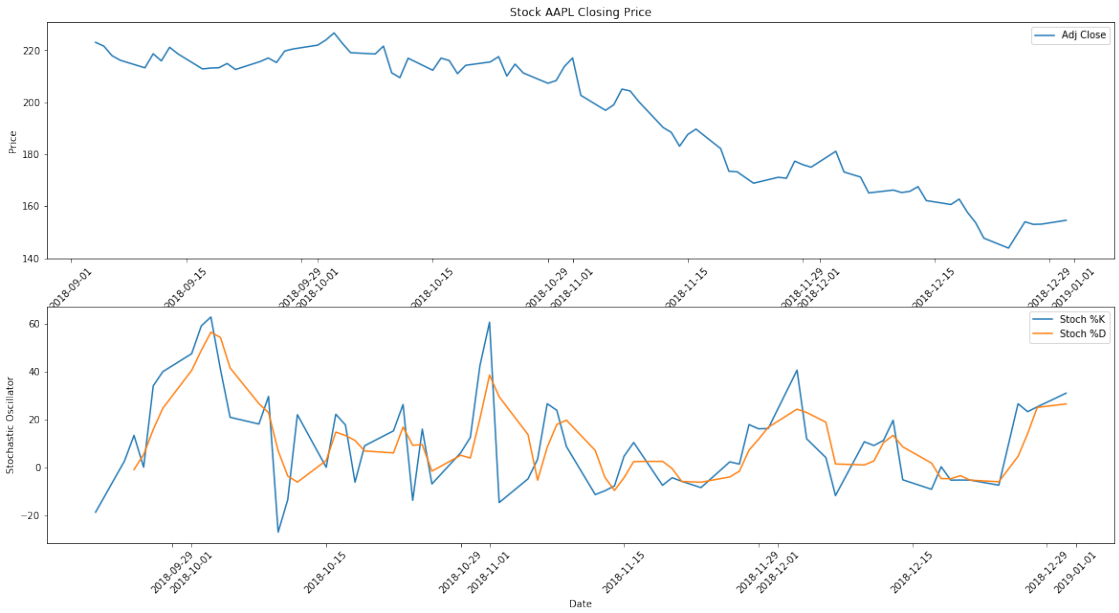
[5]:
```
df.tail()
```

[5]:

Date	Adj Close	Close	High	Low	Open	Volume	stoch_k	stoch_d
2018-12-24	143.924454	146.830002	151.550003	146.589996	148.149994	37169200	-7.445649	-6.028773
2018-12-26	154.059814	157.169998	157.229996	146.720001	148.300003	58582500	26.498111	4.573466
2018-12-27	153.059998	156.149994	156.770004	150.070007	155.839996	53117100	23.189961	14.080808
2018-12-28	153.138428	156.229996	158.520004	154.550003	157.500000	42291400	25.205653	24.964575
2018-12-31	154.618546	157.740005	159.360001	156.479996	158.529999	35003500	30.902794	26.432803

[6]:
```
fig = plt.figure(figsize=(20,10))
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')
ax1.tick_params(axis='x', rotation=45)

ax2 = plt.subplot(2, 1, 2)
ax2.plot(df['stoch_k'], label='Stoch %K')
ax2.plot(df['stoch_d'], label='Stoch %D')
ax2.legend(loc='best')
ax2.set_ylabel('Stochastic Oscillator')
ax2.set_xlabel('Date')
ax2.tick_params(axis='x', rotation=45)
```



1.1 Candlestick with Stochastic Oscillator

[7]:
```
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()
```

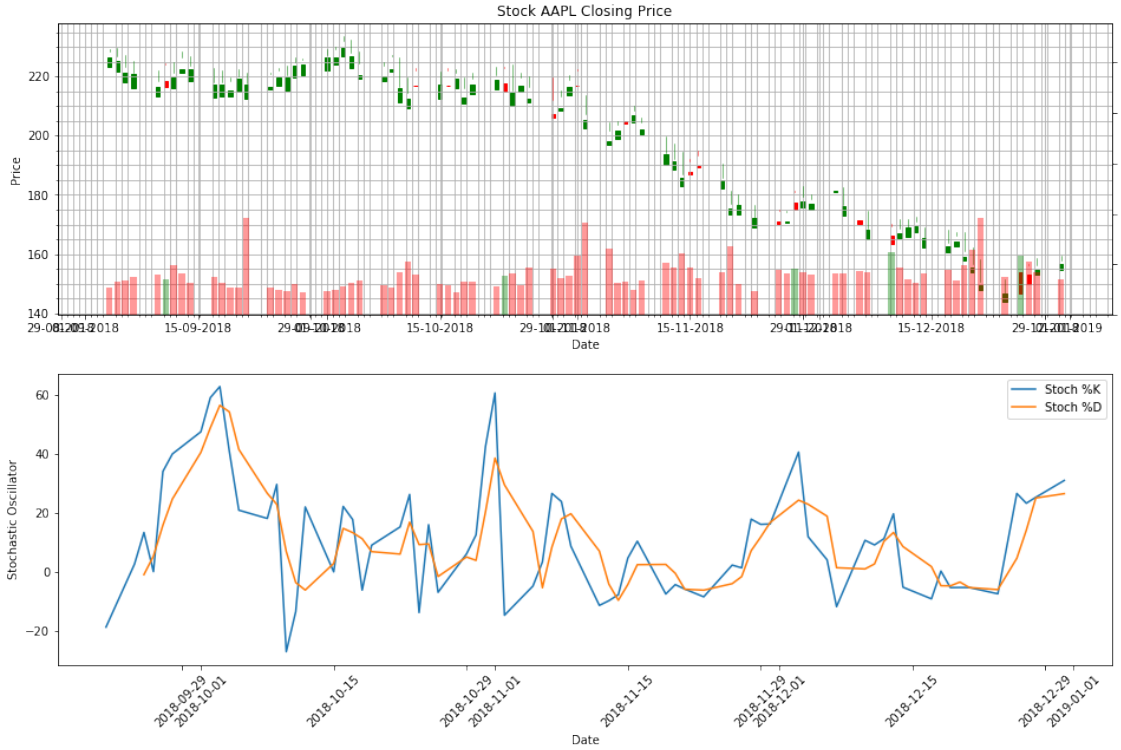
[7]:

	Date	Adj Close	Close	High	Low	Open	Volume	stoch_k	stoch_d	VolumePositive
0	736941.0	223.062759	228.360001	229.179993	226.630005	228.410004	27390100	NaN	NaN	False
1	736942.0	221.607346	226.869995	229.669998	225.100006	228.990005	33333000	NaN	NaN	False
2	736943.0	217.924789	223.100006	227.350006	221.300003	226.229996	34290000	NaN	NaN	False
3	736944.0	216.166550	221.300003	225.369995	220.710007	221.850006	37619800	NaN	NaN	False
4	736947.0	213.265411	218.330002	221.850006	216.470001	220.949997	39516500	NaN	NaN	False

[8]:
```
from mpl_finance import candlestick_ohlc

fig = plt.figure(figsize=(16,10))
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')
ax1.set_xlabel('Date')

ax2 = plt.subplot(2, 1, 2)
ax2.plot(df['stoch_k'], label='Stoch %K')
ax2.plot(df['stoch_d'], label='Stoch %D')
ax2.legend(loc='best')
ax2.set_ylabel('Stochastic Oscillator')
ax2.set_xlabel('Date')
ax2.tick_params(axis='x', rotation=45)
```


Stock AAPL Closing Price
Price
Date
Stoch %K
Stoch %D
Stochastic Oscillator
Date