Stochastic_Slow

September 29, 2021

1 Slow Stochastic

[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 = '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
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	62404000
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	

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

[3]:
```
n = 14 # number of days
s = 3 # smoothing
df['High_Highest'] = df['Adj Close'].rolling(n).max()
df['Low_Lowest'] = df['Adj Close'].rolling(n).min()
df['Fast_%K'] = ((df['Adj Close'] - df['Low_Lowest']) / (df['High_Highest'] -␣
 ↪df['Low_Lowest'])) * 100
df['Slow_%K'] = df['Fast_%K'].rolling(s).mean()
df['Slow_%D'] = df['Slow_%K'].rolling(s).mean()
```

[4]:
```
df.head(30)
```

[4]:

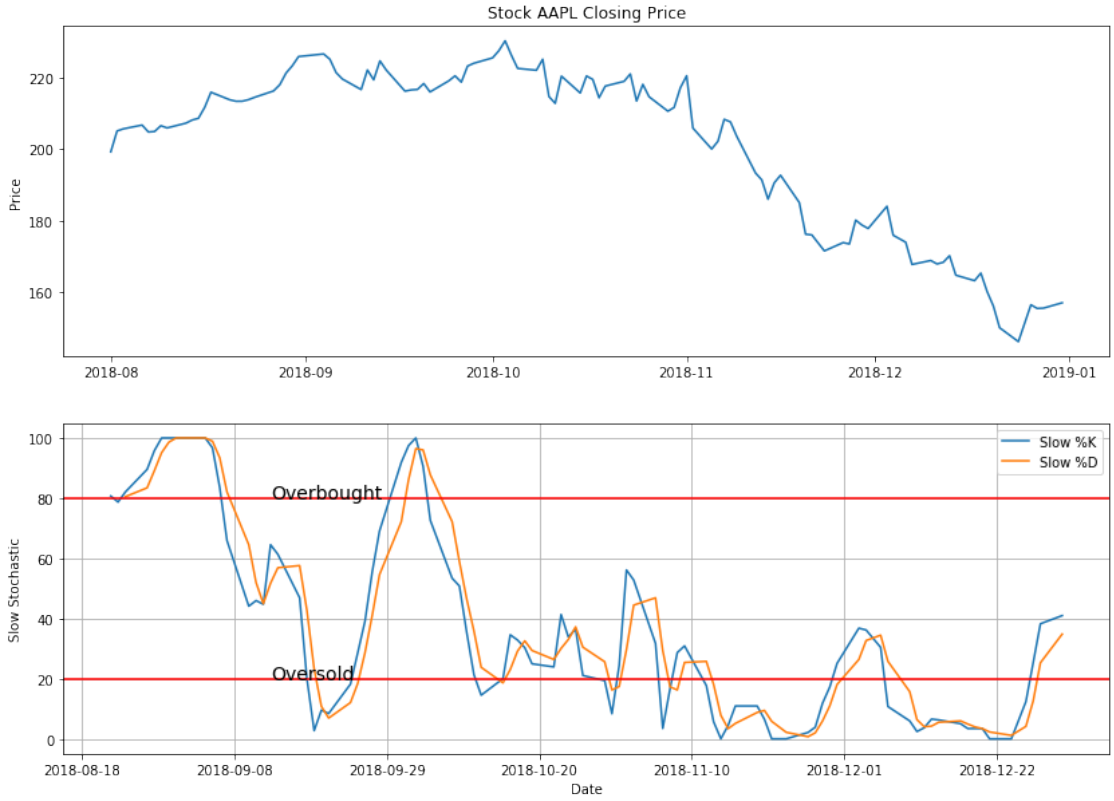
Date	Open	High	Low	Close	Adj Close
2018-08-01	199.130005	201.759995	197.309998	201.500000	199.243088
2018-08-02	200.580002	208.380005	200.350006	207.389999	205.067123
2018-08-03	207.029999	208.740005	205.479996	207.990005	205.660416
2018-08-06	208.000000	209.250000	207.070007	209.070007	206.728317
2018-08-07	209.320007	209.500000	206.759995	207.110001	204.790268
2018-08-08	206.050003	207.809998	204.520004	207.250000	204.928696
2018-08-09	207.279999	209.779999	207.199997	208.880005	206.540436
2018-08-10	207.360001	209.100006	206.669998	207.529999	205.925232
2018-08-13	207.699997	210.949997	207.699997	208.869995	207.254883
2018-08-14	210.160004	210.559998	208.259995	209.750000	208.128067
2018-08-15	209.220001	210.740005	208.330002	210.240005	208.614273
2018-08-16	211.750000	213.809998	211.470001	213.320007	211.670471
2018-08-17	213.440002	217.949997	213.160004	217.580002	215.897522
2018-08-20	218.100006	219.179993	215.110001	215.460007	213.793930
2018-08-21	216.800003	217.190002	214.029999	215.039993	213.377167
2018-08-22	214.100006	216.360001	213.839996	215.050003	213.387085
2018-08-23	214.649994	217.050003	214.600006	215.490005	213.823685
2018-08-24	216.600006	216.899994	215.110001	216.160004	214.488495
2018-08-27	217.149994	218.740005	216.330002	217.940002	216.254745
2018-08-28	219.009995	220.539993	218.919998	219.699997	218.001129
2018-08-29	220.149994	223.490005	219.410004	222.979996	221.255753
2018-08-30	223.250000	228.259995	222.399994	225.029999	223.289917
2018-08-31	226.509995	228.869995	226.000000	227.630005	225.869812
2018-09-04	228.410004	229.179993	226.630005	228.360001	226.594162
2018-09-05	228.990005	229.669998	225.100006	226.869995	225.115677
2018-09-06	226.229996	227.350006	221.300003	223.100006	221.374847
2018-09-07	221.850006	225.369995	220.710007	221.300003	219.588760
2018-09-10	220.949997	221.850006	216.470001	218.330002	216.641724
2018-09-11	218.009995	224.300003	216.559998	223.850006	222.119049
2018-09-12	224.940002	225.000000	219.839996	221.070007	219.360550

Date	Volume	High_Highest	Low_Lowest	Fast_%K	Slow_%K	Slow_%D
2018-08-01	67935700	NaN	NaN	NaN	NaN	NaN
2018-08-02	62404000	NaN	NaN	NaN	NaN	NaN
2018-08-03	33447400	NaN	NaN	NaN	NaN	NaN
2018-08-06	25425400	NaN	NaN	NaN	NaN	NaN
2018-08-07	25587400	NaN	NaN	NaN	NaN	NaN
2018-08-08	22525500	NaN	NaN	NaN	NaN	NaN
2018-08-09	23469200	NaN	NaN	NaN	NaN	NaN
2018-08-10	24611200	NaN	NaN	NaN	NaN	NaN
2018-08-13	25869100	NaN	NaN	NaN	NaN	NaN
2018-08-14	20748000	NaN	NaN	NaN	NaN	NaN
2018-08-15	28807600	NaN	NaN	NaN	NaN	NaN
2018-08-16	28500400	NaN	NaN	NaN	NaN	NaN
2018-08-17	35427000	NaN	NaN	NaN	NaN	NaN
2018-08-20	30287700	215.897522	199.243088	87.369177	NaN	NaN
2018-08-21	26159800	215.897522	204.790268	77.308928	NaN	NaN
2018-08-22	19018100	215.897522	204.790268	77.398221	80.692109	NaN
2018-08-23	18883200	215.897522	204.790268	81.328986	78.678712	NaN
2018-08-24	18476400	215.897522	204.790268	87.314353	82.013853	NaN
2018-08-27	20525100	216.254745	204.928696	100.000000	89.547780	NaN
2018-08-28	22776800	218.001129	205.925232	100.000000	95.771451	NaN
2018-08-29	27254800	221.255753	205.925232	100.000000	100.000000	NaN
2018-08-30	48793800	223.289917	207.254883	100.000000	100.000000	NaN
2018-08-31	43340100	225.869812	208.128067	100.000000	100.000000	NaN
2018-09-04	27390100	226.594162	208.614273	100.000000	100.000000	NaN
2018-09-05	33333000	226.594162	211.670471	90.093034	96.697678	NaN
2018-09-06	34290000	226.594162	213.377167	60.510577	83.534537	NaN
2018-09-07	37619800	226.594162	213.377167	46.997014	65.866875	NaN
2018-09-10	39516500	226.594162	213.377167	24.699692	44.069094	NaN
2018-09-11	35749000	226.594162	213.387085	66.115795	45.937500	NaN
2018-09-12	49278700	226.594162	213.823685	43.356760	44.724082	NaN
2018-08-01	NaN					
2018-08-02	NaN					
2018-08-03	NaN					
2018-08-06	NaN					
2018-08-07	NaN					
2018-08-08	NaN					
2018-08-09	NaN					
2018-08-10	NaN					
2018-08-13	NaN					
2018-08-14	NaN					
2018-08-15	NaN					

```
2018-08-16         NaN
2018-08-17         NaN
2018-08-20         NaN
2018-08-21         NaN
2018-08-22         NaN
2018-08-23         NaN
2018-08-24   80.461558
2018-08-27   83.413448
2018-08-28   89.111028
2018-08-29   95.106410
2018-08-30   98.590484
2018-08-31  100.000000
2018-09-04  100.000000
2018-09-05   98.899226
2018-09-06   93.410738
2018-09-07   82.033030
2018-09-10   64.490169
2018-09-11   51.957823
2018-09-12   44.910226
```

[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['Slow_%K'], label='Slow %K')
ax2.plot(df['Slow_%D'], label='Slow %D')
ax2.text(s='Overbought', x=df.index[30], y=80, fontsize=14)
ax2.text(s='Oversold', x=df.index[30], y=20, fontsize=14)
ax2.axhline(y=80, color='red')
ax2.axhline(y=20, color='red')
ax2.grid()
ax2.set_ylabel('Slow Stochastic')
ax2.legend(loc='best')
ax2.set_xlabel('Date')
```

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



1.1 Candlestick with Slow Stochastic

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

[6]:

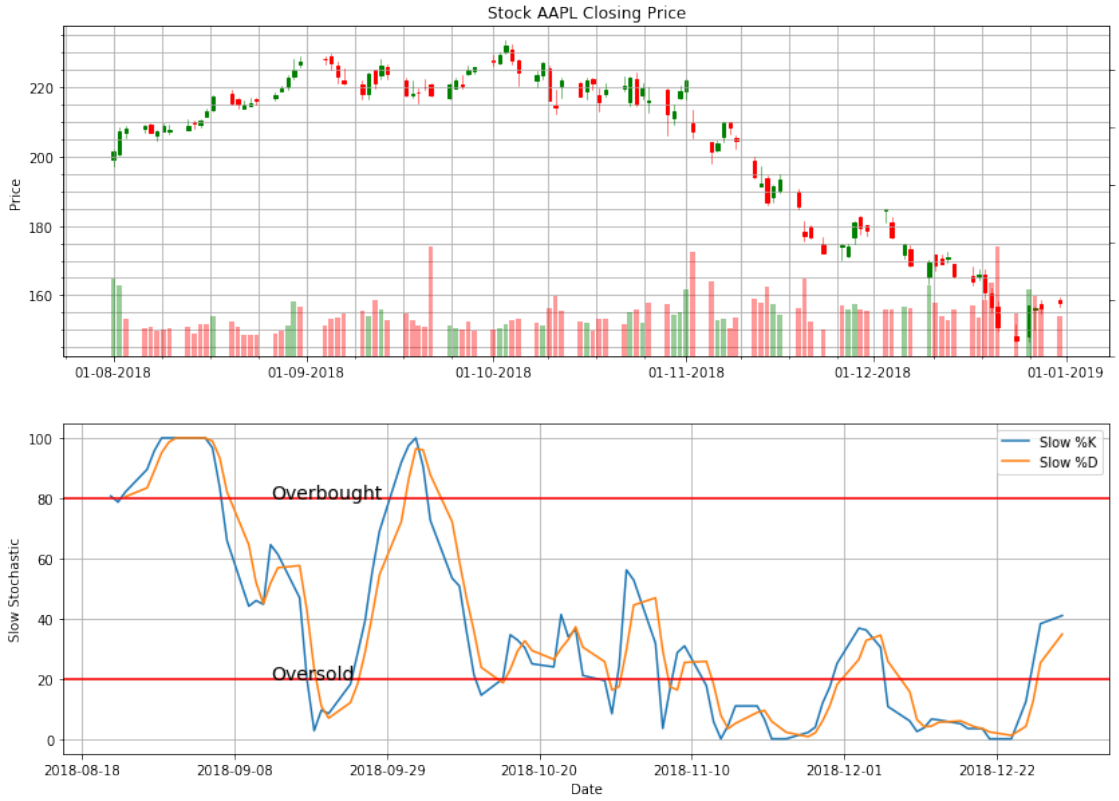
	Date	Open	High	Low	Close	Adj Close	\
0	736907.0	199.130005	201.759995	197.309998	201.500000	199.243088	
1	736908.0	200.580002	208.380005	200.350006	207.389999	205.067123	
2	736909.0	207.029999	208.740005	205.479996	207.990005	205.660416	
3	736912.0	208.000000	209.250000	207.070007	209.070007	206.728317	
4	736913.0	209.320007	209.500000	206.759995	207.110001	204.790268	

	Volume	High_Highest	Low_Lowest	Fast_%K	Slow_%K	Slow_%D	\
0	67935700	NaN	NaN	NaN	NaN	NaN	

```
1  62404000          NaN         NaN      NaN      NaN      NaN
2  33447400          NaN         NaN      NaN      NaN      NaN
3  25425400          NaN         NaN      NaN      NaN      NaN
4  25587400          NaN         NaN      NaN      NaN      NaN

   VolumePositive
0            True
1            True
2           False
3           False
4           False
```

[7]:
```
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['Slow_%K'], label='Slow %K')
ax2.plot(df['Slow_%D'], label='Slow %D')
ax2.text(s='Overbought', x=df.index[30], y=80, fontsize=14)
ax2.text(s='Oversold', x=df.index[30], y=20, fontsize=14)
ax2.axhline(y=80, color='red')
ax2.axhline(y=20, color='red')
ax2.grid()
ax2.set_ylabel('Slow Stochastic')
ax2.legend(loc='best')
ax2.set_xlabel('Date')
```

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


Stock AAPL Closing Price
Price
220
200
180
160
01-08-2018
01-09-2018
01-10-2018
01-11-2018
01-12-2018
01-01-2019
Slow %K
Slow %D
Overbought
Oversold
Slow Stochastic
100
80
60
40
20
0
2018-08-18
2018-09-08
2018-09-29
2018-10-20
2018-11-10
2018-12-01
2018-12-22
Date