Martin_Pring_Special_K

September 29, 2021

1 Martin Pring's Special K

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

[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 = '2012-01-01'
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
2012-01-03	58.485714	58.928570	58.428570	58.747143	39.172771	75555200
2012-01-04	58.571430	59.240002	58.468571	59.062859	39.383293	65005500
2012-01-05	59.278572	59.792858	58.952858	59.718571	39.820515	67817400
2012-01-06	59.967144	60.392857	59.888573	60.342857	40.236809	79573200
2012-01-09	60.785713	61.107143	60.192856	60.247143	40.172970	98506100

[3]:
```
import talib as ta
```

[4]:
```
df['200MA'] = df['Adj Close'].rolling(200).mean()
```

[5]:
```
df['SMA10'] = ta.SMA(df['Adj Close'], timeperiod=10)
df['SMA15'] = ta.SMA(df['Adj Close'], timeperiod=15)
df['SMA50'] = ta.SMA(df['Adj Close'], timeperiod=50)
df['SMA65'] = ta.SMA(df['Adj Close'], timeperiod=65)
df['SMA75'] = ta.SMA(df['Adj Close'], timeperiod=75)
df['SMA100'] = ta.SMA(df['Adj Close'], timeperiod=100)
df['SMA130'] = ta.SMA(df['Adj Close'], timeperiod=130)
df['SMA195'] = ta.SMA(df['Adj Close'], timeperiod=195)

df['ROC10'] = ta.ROC(df['SMA10'], timeperiod=10)
df['ROC15'] = ta.ROC(df['SMA10'], timeperiod=15)
df['ROC20'] = ta.ROC(df['SMA10'], timeperiod=20)
df['ROC30'] = ta.ROC(df['SMA15'], timeperiod=30)
df['ROC40'] = ta.ROC(df['SMA50'] , timeperiod=40)
df['ROC65'] = ta.ROC(df['SMA65'], timeperiod=65)
df['ROC75'] = ta.ROC(df['SMA75'], timeperiod=75)
df['ROC100'] = ta.ROC(df['SMA100'], timeperiod=100)
df['ROC195'] = ta.ROC(df['SMA130'], timeperiod=100)
df['ROC265'] = ta.ROC(df['SMA130'], timeperiod=265)
df['ROC390'] = ta.ROC(df['SMA130'], timeperiod=390)
df['ROC530'] = ta.ROC(df['SMA195'], timeperiod=530)
```

[6]:
```
df['Special_K'] = (df['ROC10'] * 1) + (df['ROC15'] * 2) + (df['ROC20'] * 3) +␣
↪(df['ROC30']) * 4 + (df['ROC40'] * 1) + (df['ROC65'] * 2) + (df['ROC75'] *␣
↪3) + (df['ROC100'] * 4) + (df['ROC195'] * 1) + (df['ROC265'] * 2) +␣
↪(df['ROC390'] * 3) + (df['ROC530'] * 4)
```

[7]:
```
df['200MAk'] = df['Special_K'].rolling(5).mean()
```

[8]:
```
df.tail()
```

[8]:

Date	Open	High	Low	Close	Adj Close	Volume	200MA	SMA10	SMA15	SMA50
2018-12-24	148.149994	151.550003	146.589996	146.830002	146.202972	37169200	191.863233	161.253418	165.541362	190.235452
2018-12-26	148.300003	157.229996	146.720001	157.169998	156.498810	58582500	191.750755	160.112312	163.705901	188.957578
2018-12-27	155.839996	156.770004	150.070007	156.149994	155.483154	53117100	191.641818	158.822841	162.342414	187.753657
2018-12-28	157.500000	158.520004	154.550003	156.229996	155.562820	42291400	191.540814	157.357127	161.115011	186.456269
2018-12-31	158.529999	159.360001	156.479996	157.740005	157.066376					

```
2018-12-31  35003500  191.446293  156.586433  160.401405  185.208005

                …          ROC40     ROC65     ROC75     ROC100     ROC195  \
Date            …
2018-12-24      …     -13.324551 -2.304339  2.222526  13.149966  12.893005
2018-12-26      …     -13.929970 -2.989888  1.555068  12.716938  12.591626
2018-12-27      …     -14.437053 -3.733504  0.932041  12.261841  12.271443
2018-12-28      …     -15.011695 -4.496865  0.236603  11.786793  11.945178
2018-12-31      …     -15.609825 -5.238232 -0.405377  11.345544  11.649848

               ROC265     ROC390     ROC530   Special_K      200MAk
Date
2018-12-24  30.028210  53.104589  93.212859  489.719075  514.988971
2018-12-26  29.776356  52.542781  92.998107  480.152995  503.639532
2018-12-27  29.543304  52.027246  92.744358  470.768037  492.270350
2018-12-28  29.302134  51.551916  92.506584  459.513122  480.878122
2018-12-31  29.085364  51.086435  92.290868  452.133505  470.457347

[5 rows x 29 columns]
```

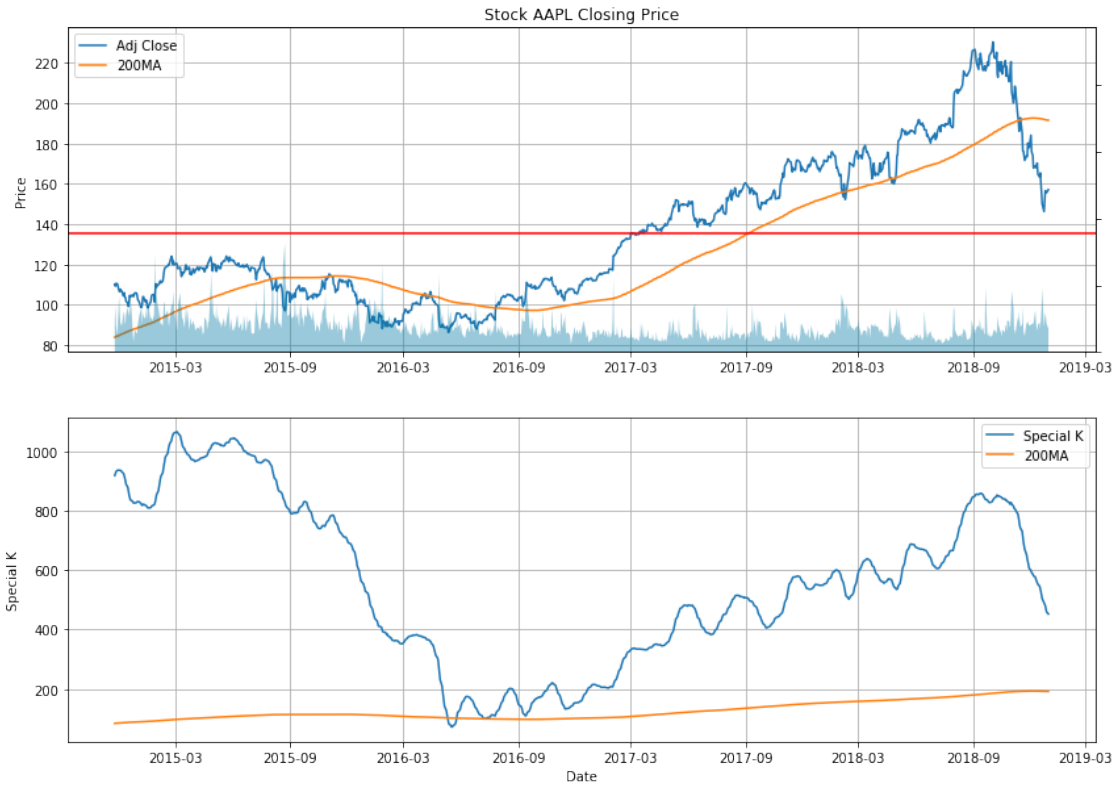
[9]:
```
df = df.dropna()
```

[10]:
```
# Line Chart
fig = plt.figure(figsize=(14,10))
ax1 = plt.subplot(2, 1, 1)
ax1.plot(df.index, df['Adj Close'])
ax1.plot(df.index, df['200MA'])
ax1.axhline(y=df['Adj Close'].mean(),color='r')
ax1.grid()
#ax1.grid(True, which='both')
#ax1.grid(which='minor', linestyle='-', linewidth='0.5', color='black')
#ax1.grid(which='major', linestyle='-', linewidth='0.5', color='red')
#ax1.minorticks_on()
#ax1.legend(loc='best')
ax1v = ax1.twinx()
ax1v.fill_between(df.index[0:],0, df.Volume[0:], facecolor='#0079a3', 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.legend(loc='best')

ax2 = plt.subplot(2, 1, 2)
ax2.plot(df['Special_K'], label='Special K')
ax2.plot(df['200MA'])
ax2.grid()
ax2.set_ylabel('Special K')
```

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

[10]: <matplotlib.legend.Legend at 0x25123943c88>



1.1 Candlestick with Martin Pring Special K

[11]:
```
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()
```

[11]:

	Date	Open	High	Low	Close	Adj Close	\
0	735561.0	116.849998	118.769997	116.620003	118.629997	110.164543	
1	735562.0	119.070000	119.750000	117.449997	117.599998	109.208054	
2	735563.0	117.940002	119.099998	117.830002	119.000000	110.508148	
3	735565.0	119.269997	119.400002	118.050003	118.930000	110.443123	

```
4  735568.0  118.809998  119.250000  111.269997  115.070000  106.858582

     Volume       200MA        SMA10        SMA15       …            ROC65  \
0  47450800   83.885018   106.189037   104.413235       …         10.854965
1  68840400   84.092530   106.922665   104.999447       …         10.850087
2  40768300   84.306568   107.642360   105.656305       …         10.908165
3  24814400   84.514905   108.209758   106.289638       …         10.951785
4  83814000   84.705598   108.292406   106.664810       …         10.923983

        ROC75      ROC100      ROC195      ROC265      ROC390      ROC530  \
0   14.557866   26.476303   27.096698   73.815509   83.215722   50.544718
1   14.572888   26.407198   27.132392   73.851305   83.905916   50.597225
2   14.618732   26.373178   27.170764   73.947263   84.543217   50.677496
3   14.674213   26.355542   27.202361   73.989789   85.213871   50.778852
4   14.660501   26.298912   27.189576   74.001695   85.876900   50.873773

     Special_K       200MAk  VolumePositive
0   918.554483   906.459956           False
1   924.898992   912.258654           False
2   931.439768   918.485212           False
3   936.166157   924.480533           False
4   936.711392   929.554158           False

[5 rows x 31 columns]
```

[12]:
```
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.plot(df.index, df['200MA'])
ax1.set_title('Stock '+ symbol +' Closing Price')
ax1.set_ylabel('Price')
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.legend(loc='best')
```

```
ax2 = plt.subplot(2, 1, 2)
ax2.plot(df['Special_K'], label='Special K')
ax2.plot(df['200MA'])
ax1.axhline(y=0,color='r')
ax2.grid()
ax2.set_ylabel('Volume')
ax2.set_xlabel('Date')
ax2.legend(loc='best')
```

[12]: <matplotlib.legend.Legend at 0x25126ed7898>