T3_Moving_Average

September 29, 2021

1 T3 Moving Average Indicator

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

[4]:
```
e1 = ta.EMA(df['Adj Close'], timeperiod=3)
e2 = ta.EMA(e1, timeperiod=3)
e3 = ta.EMA(e2, timeperiod=3)
e4 = ta.EMA(e3, timeperiod=3)
e5 = ta.EMA(e4, timeperiod=3)
e6 = ta.EMA(e5, timeperiod=3)
# a is the volume factor, default value is 0.7 but 0.618 can also be used
a = 0.7
c1 = -a**3
c2 = (3*a**2) + (3*a**3)
c3 = - (6*a**2) - (3*a) - (3*a**3)
c4 = 1 + (3*a) + (a**3) + (3*a**2)
```

[5]:
```
df['T3'] = c1*e6 + c2*e5 + c3*e4 + c4*e3
```

[6]:
```
df = df.dropna()
df.head()
```

[6]:
```
                 Open        High         Low       Close   Adj Close  \
Date
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

              Volume          T3
Date
2018-08-17  35427000  211.991717
2018-08-20  30287700  213.592391
2018-08-21  26159800  214.120762
2018-08-22  19018100  214.105456
2018-08-23  18883200  214.050022
```

[7]:
```
from matplotlib import dates as mdates
import datetime as dt


df['VolumePositive'] = df['Open'] < df['Adj Close']
df = df.dropna()
```

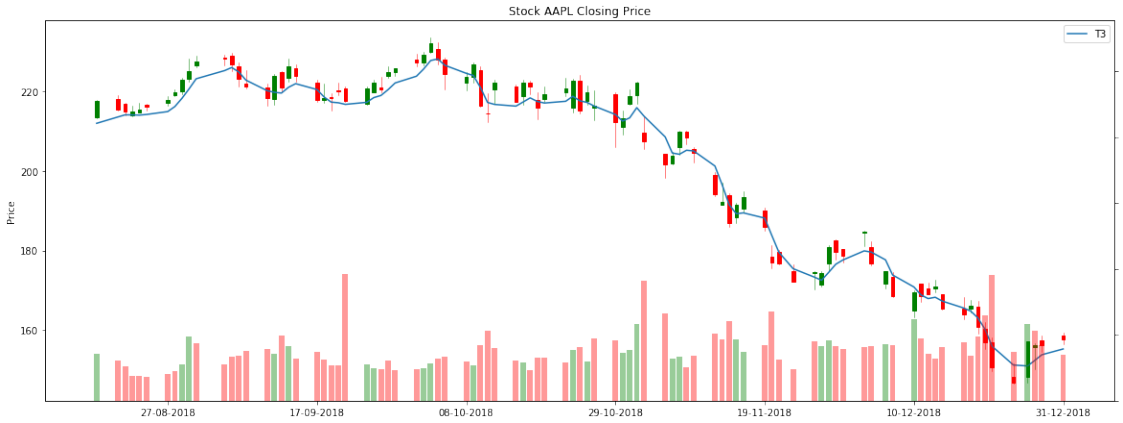
```
df = df.reset_index()
df['Date'] = mdates.date2num(df['Date'].astype(dt.date))
df.head()
```

[7]:

	Date	Open	High	Low	Close	Adj Close	Volume	T3	VolumePositive
0	736923.0	213.440002	217.949997	213.160004	217.580002	215.897522	35427000	211.991717	True
1	736926.0	218.100006	219.179993	215.110001	215.460007	213.793930	30287700	213.592391	False
2	736927.0	216.800003	217.190002	214.029999	215.039993	213.377167	26159800	214.120762	False
3	736928.0	214.100006	216.360001	213.839996	215.050003	213.387085	19018100	214.105456	False
4	736929.0	214.649994	217.050003	214.600006	215.490005	213.823685	18883200	214.050022	False

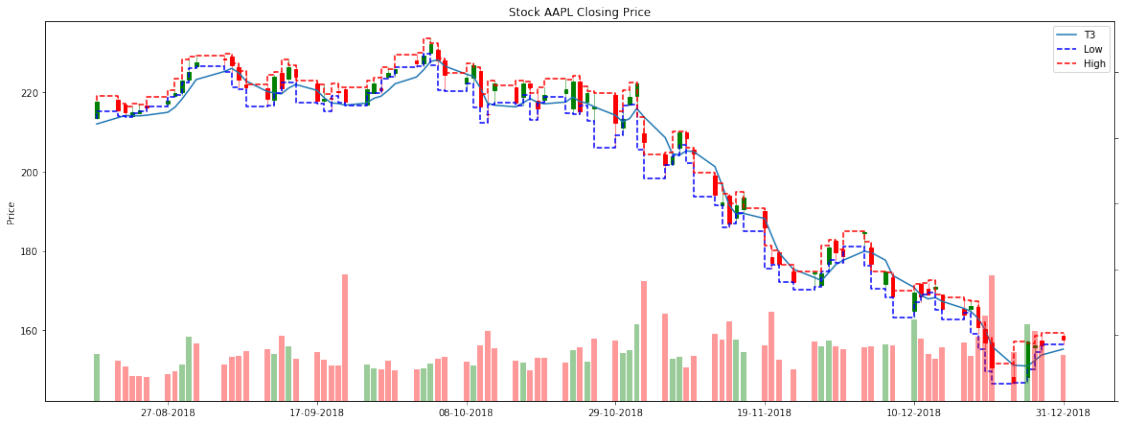
[15]:
```
from mpl_finance import candlestick_ohlc

fig = plt.figure(figsize=(20,16))
ax1 = plt.subplot(2, 1, 1)
candlestick_ohlc(ax1,df.values, width=0.5, colorup='g', colordown='r', alpha=1.
↪0)
ax1.plot(df.Date, df['T3'],label='T3')
ax1.xaxis_date()
ax1.xaxis.set_major_formatter(mdates.DateFormatter('%d-%m-%Y'))
#ax1.axhline(y=dfc['Adj Close'].mean(),color='r')
ax1v = ax1.twinx()
colors = df.VolumePositive.map({True: 'g', False: 'r'})
ax1v.bar(df.Date, df['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')
```

[15]:
```
<matplotlib.legend.Legend at 0x25e1a5dfa58>
```

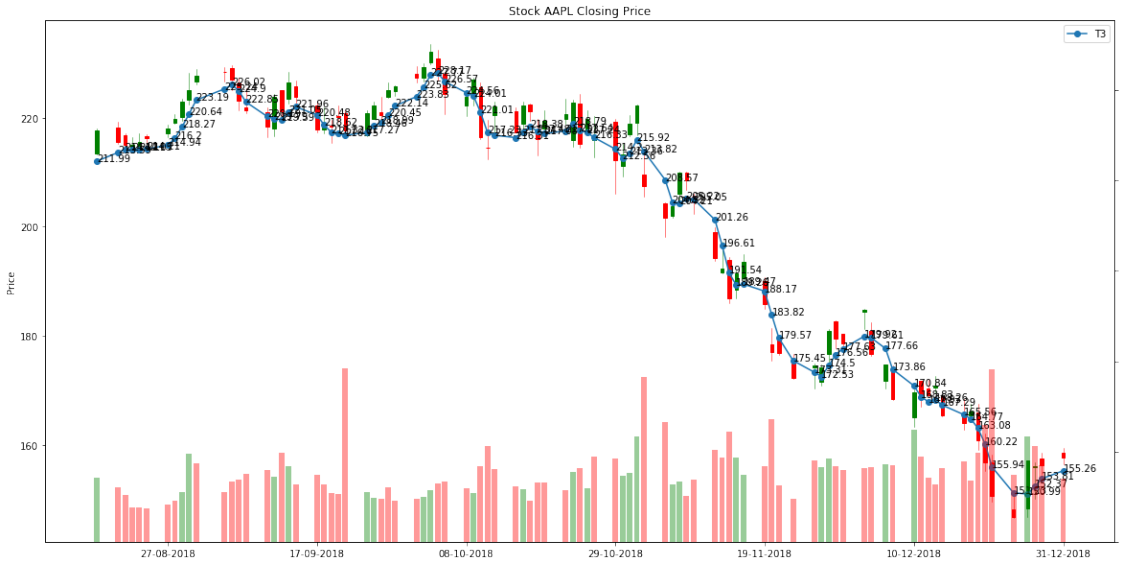


[19]:
```
fig = plt.figure(figsize=(20,16))
ax1 = plt.subplot(2, 1, 1)
candlestick_ohlc(ax1,df.values, width=0.5, colorup='g', colordown='r', alpha=1.
↪0)
ax1.plot(df.Date, df['T3'],label='T3')
ax1.step(df.Date, df['Low'], c='blue', linestyle='--', label='Low')
ax1.step(df.Date, df['High'], c='red', linestyle='--', label='High')
ax1.xaxis_date()
ax1.xaxis.set_major_formatter(mdates.DateFormatter('%d-%m-%Y'))
#ax1.axhline(y=dfc['Adj Close'].mean(),color='r')
ax1v = ax1.twinx()
colors = df.VolumePositive.map({True: 'g', False: 'r'})
ax1v.bar(df.Date, df['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')
```

[19]: <matplotlib.legend.Legend at 0x25e1c768d68>



[33]:
```
fig = plt.figure(figsize=(20,10))
ax1 = fig.add_subplot(111)
candlestick_ohlc(ax1,df.values, width=0.5, colorup='g', colordown='r', alpha=1.
 ↪0)
plt.plot(df.Date, df['T3'],marker='o',label='T3')
for i,j in zip(df.Date, round(df['T3'],2)):
    ax1.annotate(j, xy=(i, j))
ax1.xaxis_date()
ax1.xaxis.set_major_formatter(mdates.DateFormatter('%d-%m-%Y'))
#ax1.axhline(y=dfc['Adj Close'].mean(),color='r')
ax1v = ax1.twinx()
colors = df.VolumePositive.map({True: 'g', False: 'r'})
ax1v.bar(df.Date, df['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')
plt.show()
```



[77]:
```
fig = plt.figure(figsize=(20,10))
ax1 = fig.add_subplot(111)
candlestick_ohlc(ax1,df.values[80:], width=0.5, colorup='g', colordown='r',␣
 ↪alpha=1.0)
plt.plot(df.iloc[80:, 0], df['T3'][80:],marker='o',label='T3')
for i,j in zip(df.Date[100:], round(df['T3'],2)):
```

```
    ax1.annotate(j, xy=(i, j))
ax1.xaxis_date()
ax1.xaxis.set_major_formatter(mdates.DateFormatter('%d-%m-%Y'))
#ax1.axhline(y=dfc['Adj Close'].mean(),color='r')
ax1v = ax1.twinx()
colors = df.VolumePositive.map({True: 'g', False: 'r'})
ax1v.bar(df.iloc[80:, 0], df['Volume'][80:], 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')
plt.show()
```