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]:

```
                  Open        High         Low       Close   Adj Close  \
Date
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

              Volume
Date
2018-08-01  67935700
```

```
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
```

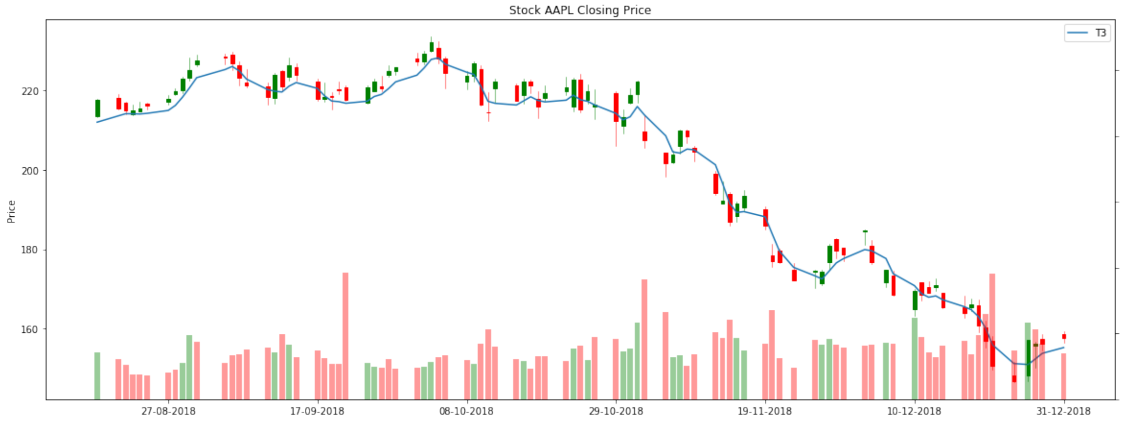
[7]:

```
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  \
     0  736923.0  213.440002  217.949997  213.160004  217.580002  215.897522
     1  736926.0  218.100006  219.179993  215.110001  215.460007  213.793930
     2  736927.0  216.800003  217.190002  214.029999  215.039993  213.377167
     3  736928.0  214.100006  216.360001  213.839996  215.050003  213.387085
     4  736929.0  214.649994  217.050003  214.600006  215.490005  213.823685

          Volume          T3  VolumePositive
     0  35427000  211.991717            True
     1  30287700  213.592391           False
     2  26159800  214.120762           False
     3  19018100  214.105456           False
     4  18883200  214.050022           False
```

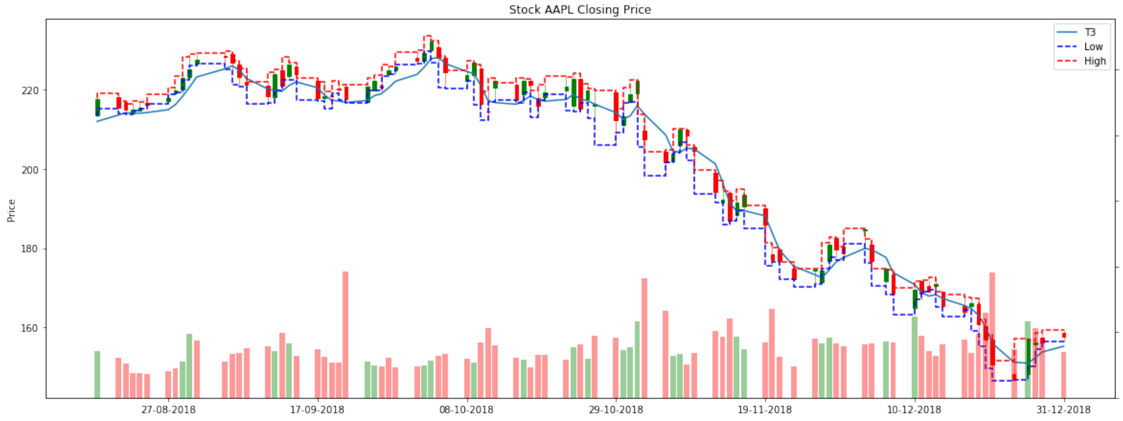
```
[15]: from mpl_finance import candlestick_ohlc

      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>
```



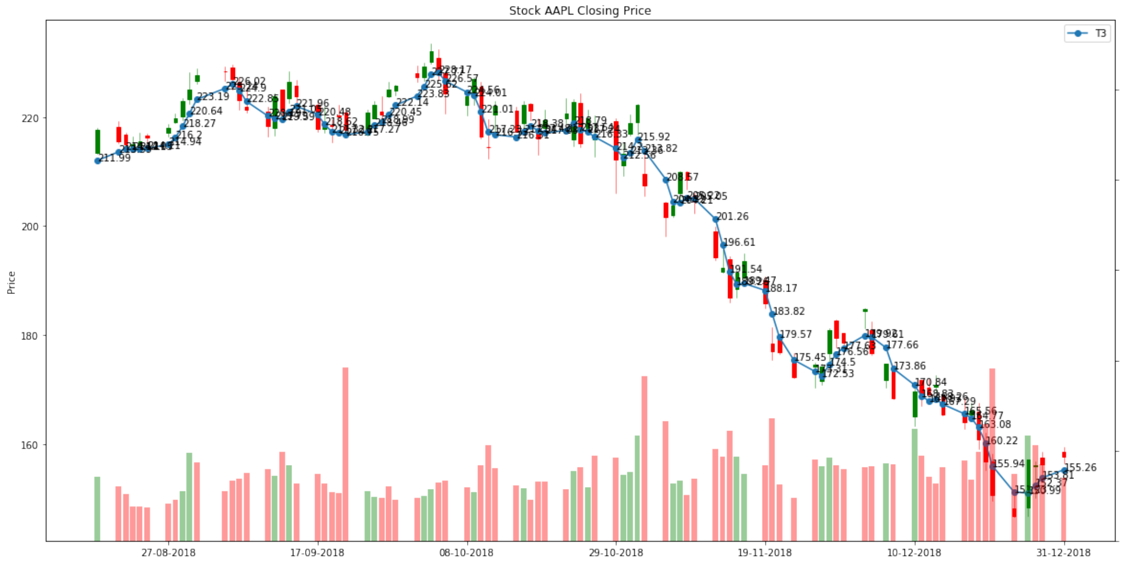
```
[19]: fig = plt.figure(figsize=(20,16))
      ax1 = plt.subplot(2, 1, 1)
      candlestick_ohlc(ax1,df.values, width=0.5, colorup='g', colordown='r', alpha=1.
       ↪0)
      ax1.plot(df.Date, df['T3'],label='T3')
      ax1.step(df.Date, df['Low'], c='blue', linestyle='--', label='Low')
      ax1.step(df.Date, 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>
```



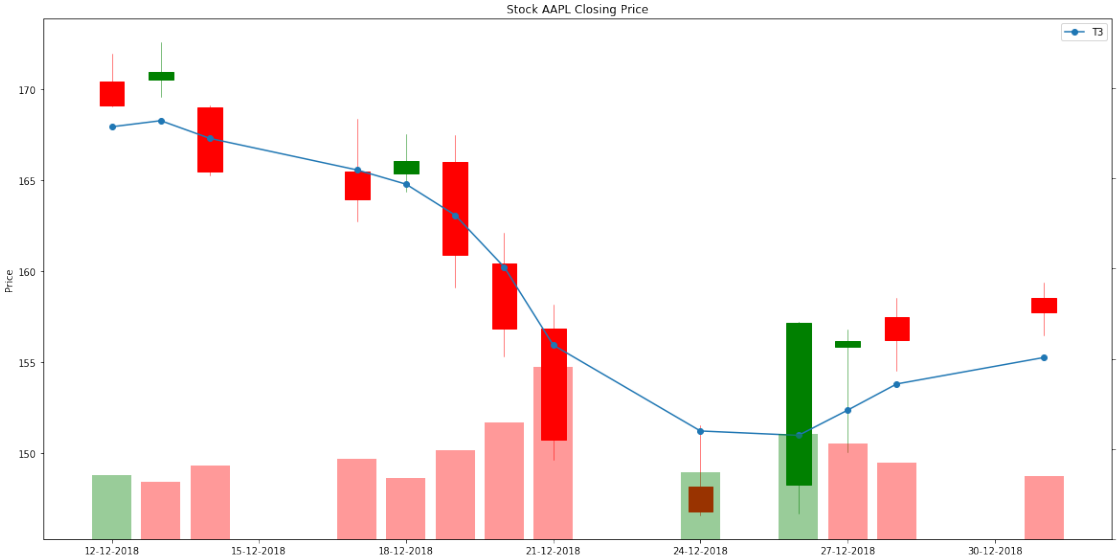
[33]:

```
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()
```


Stock AAPL Closing Price
T3
Price