Accumulation_Distribution

September 29, 2021

1 Accumulation/Distribution Line

https://www.investopedia.com/terms/a/accumulationdistribution.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
```

[16]:
```
def accumulation_distribution_line(df, n):
    adl = 0
    money_flow_multiplier = ((df['Adj Close'] - df['Low'].shift(n)) -␣
↪(df['High'].shift(n) - df['Adj Close'])) / (df['High'].shift(n) - df['Low'].
↪shift(n))
    money_flow_volume = money_flow_multiplier * df['Volume'].shift(n)
    adl = adl + money_flow_volume
    return adl
```

[17]:
```
df['ADL'] = accumulation_distribution_line(df, 14)
```

[19]:
```
df.head(20)
```

[19]:

Date	Adj Close	Close	High	Low	Open	Volume	ADL
2018-09-04	223.062759	228.360001	229.179993	226.630005	228.410004	27390100	NaN
2018-09-05	221.607346	226.869995	229.669998	225.100006	228.990005	33333000	NaN
2018-09-06	217.924789	223.100006	227.350006	221.300003	226.229996	34290000	NaN
2018-09-07	216.166550	221.300003	225.369995	220.710007	221.850006	37619800	NaN
2018-09-10	213.265411	218.330002	221.850006	216.470001	220.949997		
2018-09-11	218.657410	223.850006	224.300003	216.559998	218.009995		
2018-09-12	215.941879	221.070007	225.000000	219.839996	224.940002		
2018-09-13	221.157990	226.410004	228.350006	222.570007	223.520004		
2018-09-14	218.647614	223.839996	226.839996	222.520004	225.750000		
2018-09-17	212.825882	217.880005	222.949997	217.270004	222.149994		
2018-09-18	213.177521	218.240005	221.850006	217.119995	217.789993		
2018-09-19	213.304474	218.369995	219.619995	215.300003	218.500000		
2018-09-20	214.926010	220.029999	222.279999	219.149994	220.240005		
2018-09-21	212.610977	217.660004	221.360001	217.289993	220.779999		
2018-09-24	215.668365	220.789993	221.259995	216.630005	216.820007		
2018-09-25	217.035889	222.190002	222.820007	219.699997	219.750000		
2018-09-26	215.306931	220.419998	223.750000	219.759995	221.000000		
2018-09-27	219.731857	224.949997	226.440002	223.539993	223.820007		
2018-09-28	220.503540	225.740005	225.839996	224.020004	224.789993		
2018-10-01	221.988266	227.259995	229.419998	226.350006	227.949997		

```
2018-09-10  39516500           NaN
2018-09-11  35749000           NaN
2018-09-12  49278700           NaN
2018-09-13  41706400           NaN
2018-09-14  31999300           NaN
2018-09-17  37195100           NaN
2018-09-18  31571700           NaN
2018-09-19  27123800           NaN
2018-09-20  26608800           NaN
2018-09-21  96246700           NaN
2018-09-24  27693400 -2.628739e+08
2018-09-25  24554400 -1.509705e+08
2018-09-26  23984700 -1.022247e+08
2018-09-27  30181200 -5.341288e+07
2018-09-28  22929400  1.973673e+07
2018-10-01  23600800  1.439442e+07
```

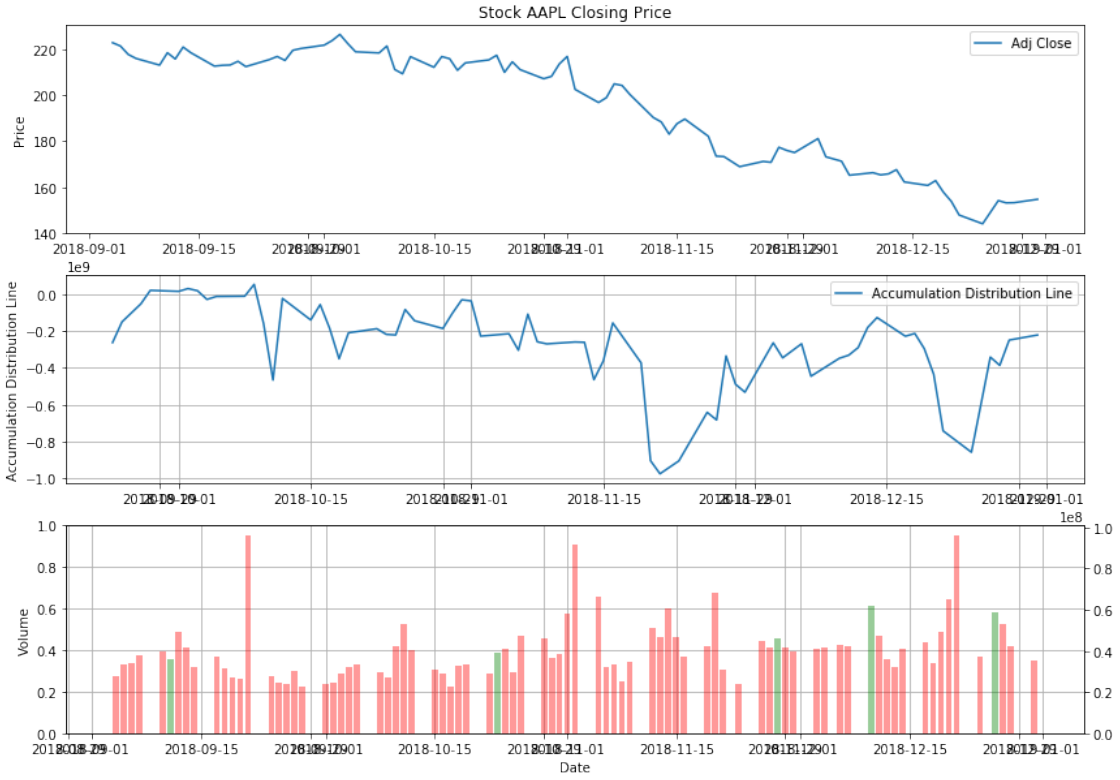
[20]:
```
df['VolumePositive'] = df['Open'] < df['Adj Close']
```

[21]:
```
fig = plt.figure(figsize=(14,10))
ax1 = plt.subplot(3, 1, 1)
ax1.plot(df['Adj Close'])
ax1.set_title('Stock '+ symbol +' Closing Price')
ax1.set_ylabel('Price')
ax1.legend(loc='best')

ax2 = plt.subplot(3, 1, 2)
ax2.plot(df['ADL'], label='Accumulation Distribution Line')
ax2.grid()
ax2.legend(loc='best')
ax2.set_ylabel('Accumulation Distribution Line')

ax3 = plt.subplot(3, 1, 3)
ax3v = ax3.twinx()
colors = df.VolumePositive.map({True: 'g', False: 'r'})
ax3v.bar(df.index, df['Volume'], color=colors, alpha=0.4)
ax3.set_ylabel('Volume')
ax3.grid()
ax3.set_xlabel('Date')
```

[21]:
```
Text(0.5, 0, 'Date')
```



1.1 Candlestick with Accumulation/Distribution Line

[22]:
```
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()
```

[22]:

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

```
1  33333000  NaN           False
2  34290000  NaN           False
3  37619800  NaN           False
4  39516500  NaN           False
```

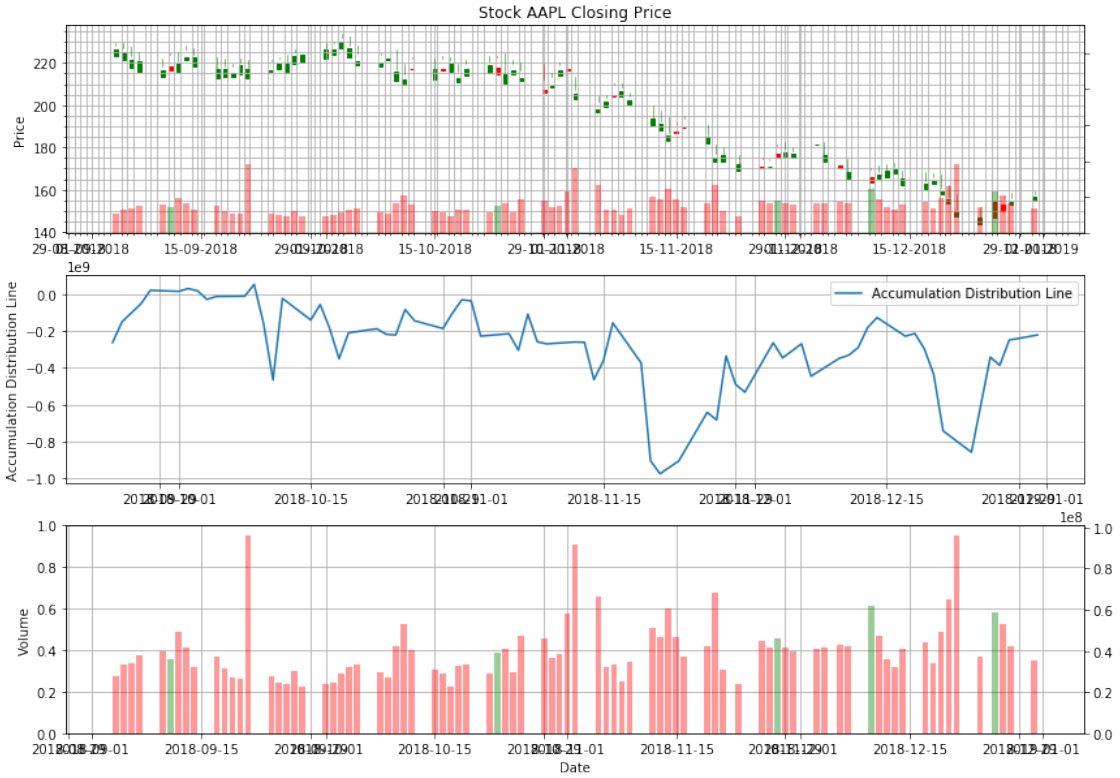
[23]:
```
from mpl_finance import candlestick_ohlc

fig = plt.figure(figsize=(14,10))
ax1 = plt.subplot(3, 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(3, 1, 2)
ax2.plot(df['ADL'], label='Accumulation Distribution Line')
ax2.grid()
ax2.legend(loc='best')
ax2.set_ylabel('Accumulation Distribution Line')

ax3 = plt.subplot(3, 1, 3)
ax3v = ax3.twinx()
colors = df.VolumePositive.map({True: 'g', False: 'r'})
ax3v.bar(df.index, df['Volume'], color=colors, alpha=0.4)
ax3.set_ylabel('Volume')
ax3.grid()
ax3.set_xlabel('Date')
```

[23]:
```
Text(0.5, 0, 'Date')
```


Stock AAPL Closing Price
Price
220
200
180
160
140
15-09-2018
15-10-2018
15-11-2018
15-12-2018
1e9
Accumulation Distribution Line
0.0
−0.2
−0.4
−0.6
−0.8
−1.0
2018-10-15
2018-11-15
2018-12-15
1e8
Volume
1.0
0.8
0.6
0.4
0.2
0.0
2018-09-15
2018-10-15
2018-11-15
2018-12-15
Date