

ADX

September 29, 2021

1 Average Directional Index (ADX)

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

Average Directional Index (ADX) is technical indicator; as a result, the values range from 0 to 100. The ADX gives a signal of trend strength.

If ADX is below 20, the trend is weak; however, if ADX is above 50, the trend is strong. ADX does not tell you the direction of the trend and it only gives the strength of the trend.

```
[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 = '2018-12-31'

# Read data
df = yf.download(symbol, start, end)

# View Columns
df.head()
```

[*****100%*****] 1 of 1 downloaded

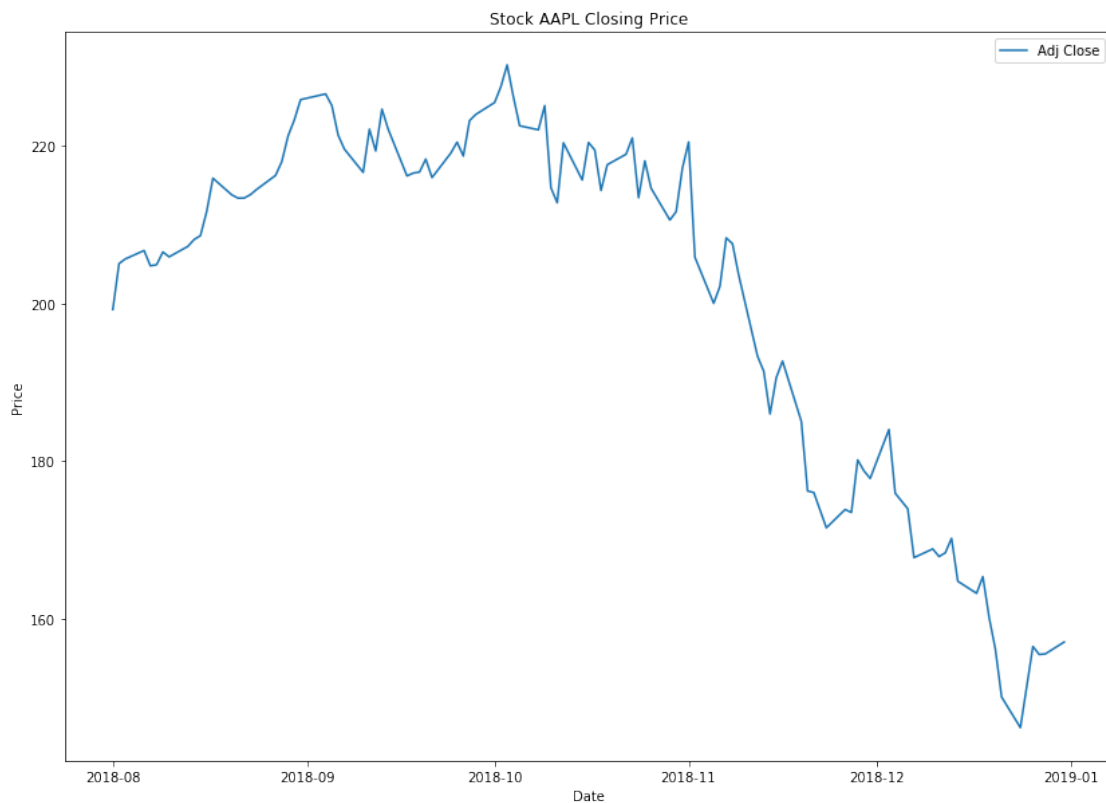
```
[2]:
```

	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]: # Simple Line Chart
plt.figure(figsize=(14,10))
plt.plot(df['Adj Close'])
plt.legend(loc='best')
plt.title('Stock ' + symbol + ' Closing Price')
plt.xlabel('Date')
plt.ylabel('Price')
plt.show()
```



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

```
[5]: adx = ta.ADX(df['High'], df['Low'],df['Adj Close'], timeperiod=14)
      adx = adx.dropna()
      adx
```

```
[5]: Date
      2018-09-10    62.531606
      2018-09-11    59.716709
      2018-09-12    57.256106
      2018-09-13    55.642423
      2018-09-14    54.124601
      2018-09-17    50.932470
      2018-09-18    47.923933
      2018-09-19    44.593145
      2018-09-20    42.191964
      2018-09-21    39.416968
      2018-09-24    36.651108
      2018-09-25    34.517000
      2018-09-26    32.787120
      2018-09-27    31.855957
      2018-09-28    30.991306
      2018-10-01    30.990275
      2018-10-02    31.106783
      2018-10-03    31.855445
      2018-10-04    31.419180
      2018-10-05    29.258502
      2018-10-08    27.177840
      2018-10-09    25.817106
      2018-10-10    24.800296
      2018-10-11    24.523185
      2018-10-12    23.458783
      2018-10-15    22.470410
      2018-10-16    21.271855
      2018-10-17    20.158910
      2018-10-18    20.373058
      2018-10-19    20.170461
      ...
      2018-11-15    33.020647
      2018-11-16    33.818358
      2018-11-19    34.924261
      2018-11-20    36.577722
      2018-11-21    38.113078
      2018-11-23    39.796565
      2018-11-26    41.460844
      2018-11-27    43.006245
      2018-11-28    42.906678
      2018-11-29    42.492468
      2018-11-30    42.175102
```

```

2018-12-03    40.895699
2018-12-04    40.266692
2018-12-06    40.247424
2018-12-07    40.415826
2018-12-10    40.977604
2018-12-11    41.127003
2018-12-12    41.236237
2018-12-13    41.181737
2018-12-14    41.546472
2018-12-17    42.111931
2018-12-18    42.637000
2018-12-19    43.574753
2018-12-20    44.722386
2018-12-21    46.144672
2018-12-24    47.633779
2018-12-26    47.605682
2018-12-27    47.579591
2018-12-28    47.128893
2018-12-31    46.503216
Length: 78, dtype: float64

```

```

[6]: # Line Chart
fig = plt.figure(figsize=(14,10))
ax1 = plt.subplot(2, 1, 1)
ax1.plot(df['Adj Close'])
#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')
ax1.set_title('Stock ' + symbol + ' Closing Price')
ax1.set_ylabel('Price')

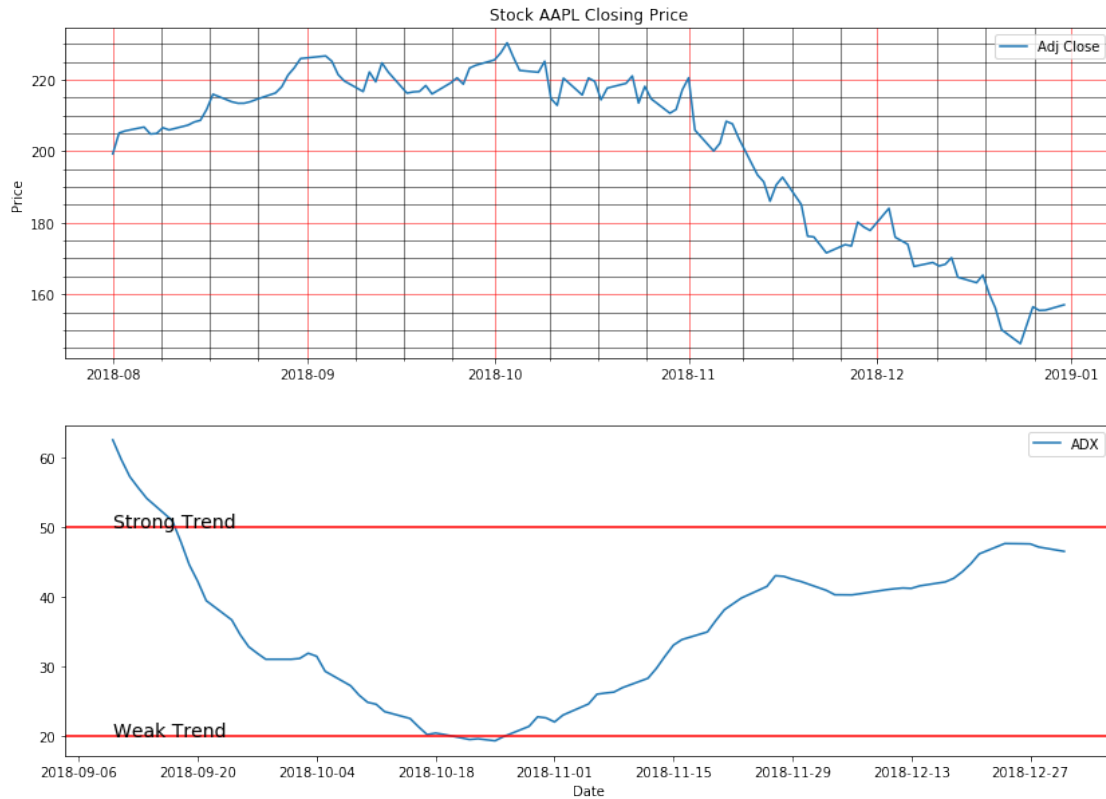
ax2 = plt.subplot(2, 1, 2)
ax2.plot(adx, '-', label='ADX')
ax2.text(s='Strong Trend', x=adx.index[0], y=50, fontsize=14)
ax2.text(s='Weak Trend', x=adx.index[0], y=20, fontsize=14)
ax2.axhline(y=50,color='r')
ax2.axhline(y=20,color='r')
ax2.set_xlabel('Date')
ax2.legend(loc='best')

```

```

[6]: <matplotlib.legend.Legend at 0x292d4ac4080>

```



1.1 Candlestick with ADX

```
[7]: # Candlestick
dfc = df.copy()

from matplotlib import dates as mdates
import datetime as dt

dfc['ADX'] = ta.ADX(dfc['High'], dfc['Low'], dfc['Adj Close'], timeperiod=14)
dfc = dfc.dropna()
dfc.head()
```

```
[7]:
```

	Open	High	Low	Close	Adj Close \
Date					
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
2018-09-13	223.520004	228.350006	222.570007	226.410004	224.659256
2018-09-14	225.750000	226.839996	222.520004	223.839996	222.109100

	Volume	ADX
--	--------	-----

Date		
2018-09-10	39516500	62.531606
2018-09-11	35749000	59.716709
2018-09-12	49278700	57.256106
2018-09-13	41706400	55.642423
2018-09-14	31999300	54.124601

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

```
[8]:
```

	Date	Open	High	Low	Close	Adj Close	\
0	736947.0	220.949997	221.850006	216.470001	218.330002	216.641724	
1	736948.0	218.009995	224.300003	216.559998	223.850006	222.119049	
2	736949.0	224.940002	225.000000	219.839996	221.070007	219.360550	
3	736950.0	223.520004	228.350006	222.570007	226.410004	224.659256	
4	736951.0	225.750000	226.839996	222.520004	223.839996	222.109100	

	Volume	ADX
0	39516500	62.531606
1	35749000	59.716709
2	49278700	57.256106
3	41706400	55.642423
4	31999300	54.124601

```
[9]: 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.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')
ax1.set_title('Stock ' + symbol + ' Closing Price')
ax1.set_ylabel('Price')

ax2 = plt.subplot(2, 1, 2)
ax2.plot(adx, '-', label='ADX')
ax2.text(s='Strong Trend', x=adx.index[0], y=50, fontsize=14)
ax2.text(s='Weak Trend', x=adx.index[0], y=20, fontsize=14)
ax2.axhline(y=50,color='r')
```

```
ax2.axhline(y=20,color='r')
ax2.set_xlabel('Date')
ax2.legend(loc='best')
```

[9]: <matplotlib.legend.Legend at 0x292d4c3dc18>



```
[10]: 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()
dfc['VolumePositive'] = dfc['Open'] < dfc['Adj Close']
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(adx, '-', label='ADX')
ax2.text(s='Strong Trend', x=adx.index[0], y=50, fontsize=14)
ax2.text(s='Weak Trend', x=adx.index[0], y=20, fontsize=14)
ax2.axhline(y=50,color='r')
ax2.axhline(y=20,color='r')
ax2.set_xlabel('Date')
ax2.legend(loc='best')

```

[10]: <matplotlib.legend.Legend at 0x292d5199748>

