

NVI

September 29, 2021

1 Negative Volume Index (NVI)

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

```
[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 = '2017-01-01'
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						
2017-01-03	115.800003	116.330002	114.760002	116.150002	112.140007	
2017-01-04	115.849998	116.510002	115.750000	116.019997	112.014503	
2017-01-05	115.919998	116.860001	115.809998	116.610001	112.584129	
2017-01-06	116.779999	118.160004	116.470001	117.910004	113.839249	
2017-01-09	117.949997	119.430000	117.940002	118.989998	114.881950	

	Volume
Date	

```

2017-01-03  28781900
2017-01-04  21118100
2017-01-05  22193600
2017-01-06  31751900
2017-01-09  33561900

```

```

[3]: df['ROC'] = ((df['Adj Close'] - df['Adj Close'].shift(1))/df['Adj Close'] * 100)
df['ROC_Volume'] = ((df['Volume'] - df['Volume'].shift(1))/df['Volume'] * 100)
df['NVI_Value'] = 0
df['NVI_Cumulative'] = 0
df1 = df[df['ROC_Volume'] < 0]
df1['NVI_Value'] = df1['ROC']
df[df['ROC_Volume'] < 0] = df1
df['NVI_Cumulative'] = 1000 + df['NVI_Value'].cumsum()

```

```

[4]: # Drop Columns
df = df.drop(['ROC', 'ROC_Volume'], axis=1)

```

```

[5]: df.head()

```

```

[5]:
      Date      Open      High      Low      Close      Adj Close  \
2017-01-03  115.800003  116.330002  114.760002  116.150002  112.140007
2017-01-04  115.849998  116.510002  115.750000  116.019997  112.014503
2017-01-05  115.919998  116.860001  115.809998  116.610001  112.584129
2017-01-06  116.779999  118.160004  116.470001  117.910004  113.839249
2017-01-09  117.949997  119.430000  117.940002  118.989998  114.881950

      Date      Volume  NVI_Value  NVI_Cumulative
2017-01-03  28781900    0.000000    1000.000000
2017-01-04  21118100   -0.111917    999.888083
2017-01-05  22193600    0.000000    999.888083
2017-01-06  31751900    0.000000    999.888083
2017-01-09  33561900    0.000000    999.888083

```

```

[6]: import talib as ta

```

```

[7]: df['EMA_100'] = ta.EMA(df['Adj Close'], timeperiod=100)
df['EMA_255'] = ta.EMA(df['Adj Close'], timeperiod=255)
df['NVI_100'] = ta.EMA(df['NVI_Cumulative'], timeperiod=100)
df['NVI_255'] = ta.EMA(df['NVI_Cumulative'], timeperiod=255)

```

```

[8]: fig = plt.figure(figsize=(14,10))
ax1 = plt.subplot(2, 1, 1)

```

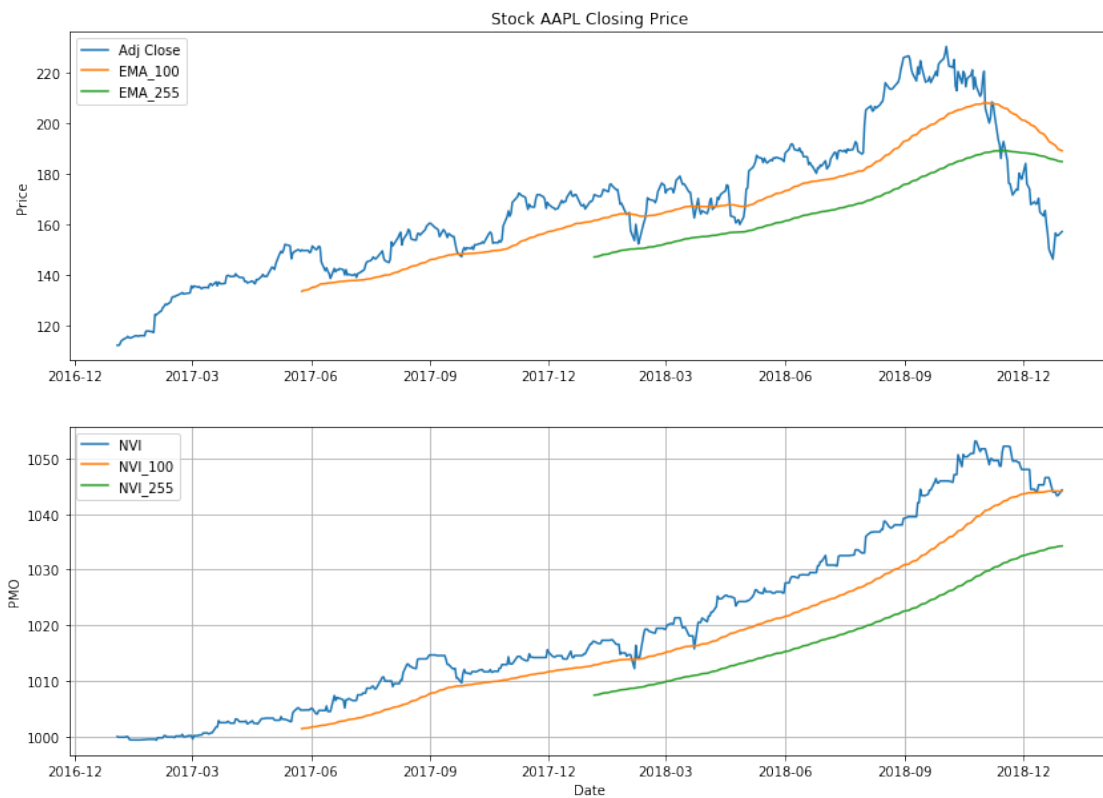
```

ax1.plot(df['Adj Close'])
ax1.plot(df['EMA_100'])
ax1.plot(df['EMA_255'])
ax1.set_title('Stock ' + symbol + ' Closing Price')
ax1.set_ylabel('Price')
ax1.legend(loc='best')

ax2 = plt.subplot(2, 1, 2)
ax2.plot(df['NVI_Cumulative'], label='NVI')
ax2.plot(df['NVI_100'])
ax2.plot(df['NVI_255'])
ax2.grid()
ax2.legend(loc='best')
ax2.set_ylabel('NVI')
ax2.set_xlabel('Date')

```

[8]: Text(0.5,0,'Date')



1.1 Candlestick with NVI

```
[9]: 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()
```

```
[9]:      Date      Open      High      Low      Close  Adj Close  \
0  736332.0  115.800003  116.330002  114.760002  116.150002  112.140007
1  736333.0  115.849998  116.510002  115.750000  116.019997  112.014503
2  736334.0  115.919998  116.860001  115.809998  116.610001  112.584129
3  736335.0  116.779999  118.160004  116.470001  117.910004  113.839249
4  736338.0  117.949997  119.430000  117.940002  118.989998  114.881950

      Volume  NVI_Value  NVI_Cumulative  EMA_100  EMA_255  NVI_100  NVI_255  \
0  28781900   0.000000   1000.000000     NaN     NaN     NaN     NaN
1  21118100  -0.111917    999.888083     NaN     NaN     NaN     NaN
2  22193600   0.000000    999.888083     NaN     NaN     NaN     NaN
3  31751900   0.000000    999.888083     NaN     NaN     NaN     NaN
4  33561900   0.000000    999.888083     NaN     NaN     NaN     NaN

      VolumePositive
0              False
1              False
2              False
3              False
4              False
```

```
[10]: 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['EMA_100'])
ax1.plot(df['EMA_255'])
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')
ax2.legend(loc='best')
ax1.set_ylabel('Price')

ax2 = plt.subplot(2, 1, 2)
ax2.plot(df['NVI_Cumulative'], label='NVI')
ax2.plot(df['NVI_100'])
ax2.plot(df['NVI_255'])
ax2.grid()
ax2.set_ylabel('NVI')
ax2.set_xlabel('Date')
ax2.legend(loc='best')

```

[10]: <matplotlib.legend.Legend at 0x22c5bb1ee10>

