Overbought-Oversold

February 2, 2021

0.0.1 필요한 모듈을 가져오고 데이터를 로드합니다

[1]:
```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import matplotlib.dates as mdates
import matplotlib.ticker as mticker
import matplotlib
from mpl_finance import candlestick_ohlc
from datetime import datetime
import seaborn as sns
sns.set()
```

```
C:\ProgramData\Anaconda3\envs\tf-1\lib\site-packages\mpl_finance.py:22:
DeprecationWarning:

  ========================================================================

   WARNING: `mpl_finance` is deprecated:

    Please use `mplfinance` instead (no hyphen, no underscore).

    To install: `pip install --upgrade mplfinance`

   For more information, see: https://pypi.org/project/mplfinance/

  ========================================================================

  category=DeprecationWarning)
```

[2]:
```
# FinanceDataReader로 데이터를 불러옵니다
# 진단할 종목은 한양증권입니다. 기간은 2020.01.29~2021.02.01 입니다.

df = pd.read_csv('C:/Jupyter_Project/HanyangSecurities.csv')
df.head()
```

[2]:

	Date	Open	High	Low	Close	Adj Close	Volume
0	2020-01-29	8740	9120	8740	9120	9120	96112

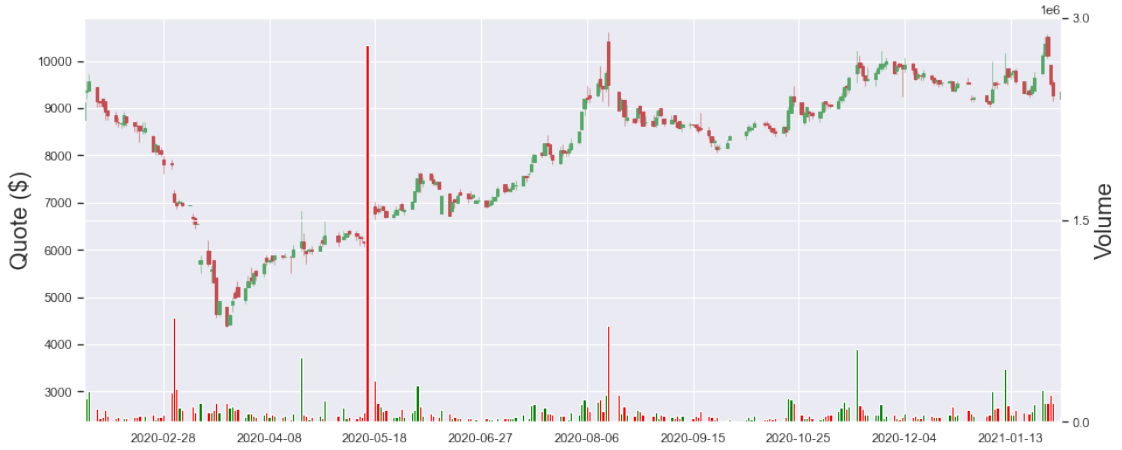
```
1  2020-01-30  9350  9570  9200  9370  9370  175760
2  2020-01-31  9380  9710  9380  9570  9570  226732
3  2020-02-03  9440  9440  9030  9140  9140   99485
4  2020-02-04  9140  9150  9020  9110  9110   30886
```

[3]:
```
date = [datetime.strptime(d, '%Y-%m-%d') for d in df['Date']]
```

[4]:
```
candlesticks = list(zip(mdates.date2num(date),df['Open'],
                    df['High'],df['Low'],df['Close'],df['Volume']))
```

0.0.2 주가와 거래량 사이의 관계를 살펴봅니다

[6]:
```
fig = plt.figure(figsize = (15, 15))
ax = fig.add_subplot(1,1,1)
ax.set_ylabel('Quote ($)', size=20)

dates = [x[0] for x in candlesticks]
dates = np.asarray(dates)
volume = [x[5] for x in candlesticks]
volume = np.asarray(volume)

candlestick_ohlc(ax, candlesticks, width=1,
                 colorup='g', colordown='r')
pad = 0.25
yl = ax.get_ylim()
ax.set_ylim(yl[0]-(yl[1]-yl[0])*pad,yl[1])
ax2 = ax.twinx()

ax2.set_position(matplotlib.transforms.Bbox([[0.125,0],[0.9,0.32]]))

pos = df['Open'] - df['Close']<0
neg = df['Open'] - df['Close']>0
ax2.bar(dates[pos],volume[pos],color='green',width=1,align='center')
ax2.bar(dates[neg],volume[neg],color='red',width=1,align='center')

ax2.set_xlim(min(dates),max(dates))
yticks = ax2.get_yticks()
ax2.set_yticks(yticks[::3])

ax2.yaxis.set_label_position("right")
ax2.set_ylabel('Volume', size=20)

ax.xaxis.set_major_formatter(mdates.DateFormatter('%Y-%m-%d'))
ax.xaxis.set_major_locator(mticker.MaxNLocator(10))

plt.show()
```



[7]:
```
def removal(signal, repeat):
    copy_signal = np.copy(signal)
    for j in range(repeat):
        for i in range(3, len(signal)):
            copy_signal[i - 1] = (copy_signal[i - 2] + copy_signal[i]) / 2
    return copy_signal

def get(original_signal, removed_signal):
    buffer = []
    for i in range(len(removed_signal)):
        buffer.append(original_signal[i] - removed_signal[i])
    return np.array(buffer)

signal = np.copy(df.Open.values)
removed_signal = removal(signal, 30)
noise_open = get(signal, removed_signal)

signal = np.copy(df.High.values)
removed_signal = removal(signal, 30)
noise_high = get(signal, removed_signal)

signal = np.copy(df.Low.values)
removed_signal = removal(signal, 30)
noise_low = get(signal, removed_signal)

signal = np.copy(df.Close.values)
removed_signal = removal(signal, 30)
noise_close = get(signal, removed_signal)
```

0.0.3 과매도 - 과매수 구간 시각화하기

그래프를 관찰하면 현재 한양증권의 주가는 Oversold line에 근접하고 있으며 이를 통해 유보하였다가 line을 돌파하면 구매하는 것이 바람직합니다

[9]:
```
noise_candlesticks = list(zip(mdates.date2num(date),noise_open,
                              noise_high,noise_low,noise_close))

fig = plt.figure(figsize = (15, 5))
ax = fig.add_subplot(1,1,1)
ax.set_ylabel('Quote ($)', size=20)

candlestick_ohlc(ax, noise_candlesticks, width=1,
                 colorup='g', colordown='r')

# ax.plot의 수치를 변화시켜서 overbought line을 관찰합니다
ax.plot(dates, [np.percentile(noise_close, 95)] * len(noise_candlesticks), color␣
 ↪= (1.0, 0.792156862745098, 0.8, 0.7),
       linewidth=5.0, label = 'overbought line')

# ax.plot의 수치를 변화시켜서 oversold line을 관찰합니다
ax.plot(dates, [np.percentile(noise_close, 10)] * len(noise_candlesticks),
        color = (0.6627450980392157, 1.0, 0.6392156862745098, 0.7),
       linewidth=5.0, label = 'oversold line')

ax.xaxis.set_major_formatter(mdates.DateFormatter('%Y-%m-%d'))
ax.xaxis.set_major_locator(mticker.MaxNLocator(10))

plt.legend()
plt.show()
```