

## assignement-2-lorenzo

August 30, 2024

```
[18]: import matplotlib.pyplot as plt
import pandas as pd
```

```
[33]: fb = pd.read_csv(
        'data/fb_stock_prices_2018.csv', index_col='date', parse_dates=True
    )

eartquake = pd.read_csv(
    'data/earthquakes.csv'
)
```

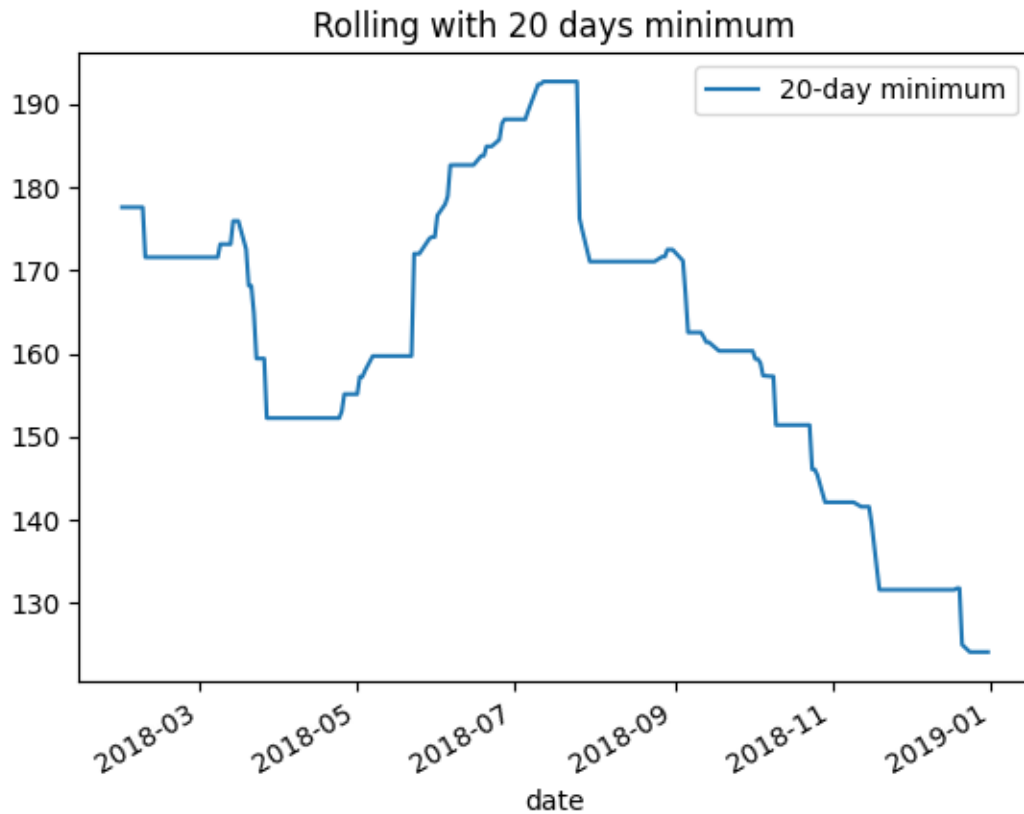
```
[51]: fb
```

```
[51]: dtype('<M8[ns]')
```

0.1 1. Plot the rolling 20-day minimum of the Facebook closing price with the pandas plot() method. (5 pts)

```
[21]: fb['20-day minimum'] = fb['close'].rolling(20).min()
fb.plot(
    kind='line',
    y='20-day minimum',
    title='Rolling with 20 days minimum'
)
```

```
[21]: <Axes: title={'center': 'Rolling with 20 days minimum'}, xlabel='date'>
```

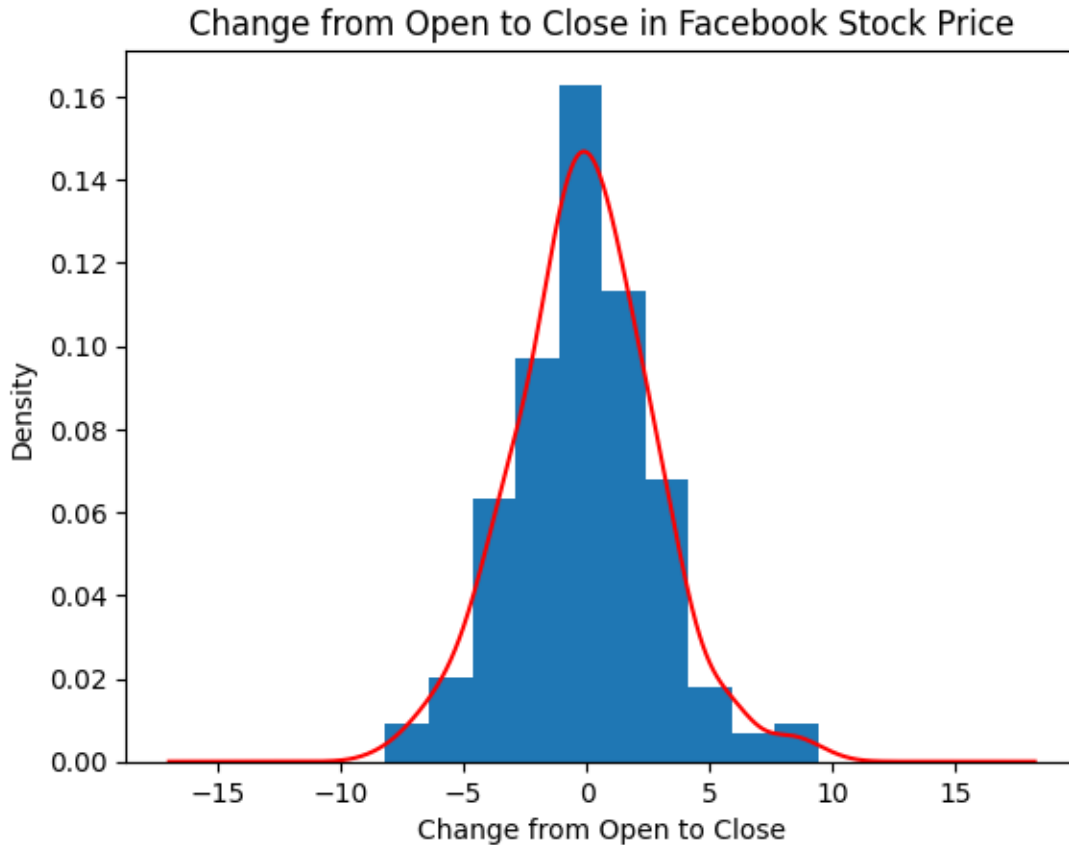


0.2 2. Create a histogram and KDE of the change from open to close in the Facebook stock price. (5 pts)

```
[28]: fb['Change from open to close'] = fb['open'] - fb['close']

ax = fb['Change from open to close'].plot(kind='hist', label='Histogram',
    ↪density=True)
fb['Change from open to close'].plot(kind='kde', ax=ax, label='KDE',
    ↪color='red')

plt.title('Change from Open to Close in Facebook Stock Price')
plt.xlabel('Change from Open to Close')
plt.show()
```



0.3 3. Using the earthquake data, create box plots for the magnitudes of each magType used in Indonesia. (5 pts)

```
[40]: earthquake['parsed_place'].unique()
```

```
[40]: array(['California', 'Dominican Republic', 'Alaska', 'Indonesia',
            'Canada', 'Puerto Rico', 'Montana', 'Nevada', 'Christmas Island',
            'Hawaii', 'Northern Mariana Islands', 'Japan', 'Ecuador',
            'Vanuatu', 'Mexico', 'Russia', 'British Virgin Islands',
            'Washington', 'Papua New Guinea', 'Fiji', 'U.S. Virgin Islands',
            'Chile', 'Peru', 'Yemen', 'Guatemala', 'Kansas', 'Australia',
            'Wyoming', 'Kuril Islands', 'Oklahoma', 'Tennessee',
            'Pacific-Antarctic Ridge', 'Utah', 'Colombia', 'Argentina',
            'Oregon', 'Greece', 'Missouri', 'Tajikistan',
            'Northern Mid-Atlantic Ridge', 'Sumatra', 'Solomon Islands',
            'Burma', 'Taiwan', 'Nicaragua',
            'South Georgia and South Sandwich Islands', 'Idaho', 'Kyrgyzstan',
            'Arizona', 'Tonga', 'Northern East Pacific Rise', 'South Africa',
            'Southern Mid-Atlantic Ridge', 'Costa Rica', 'China',
```

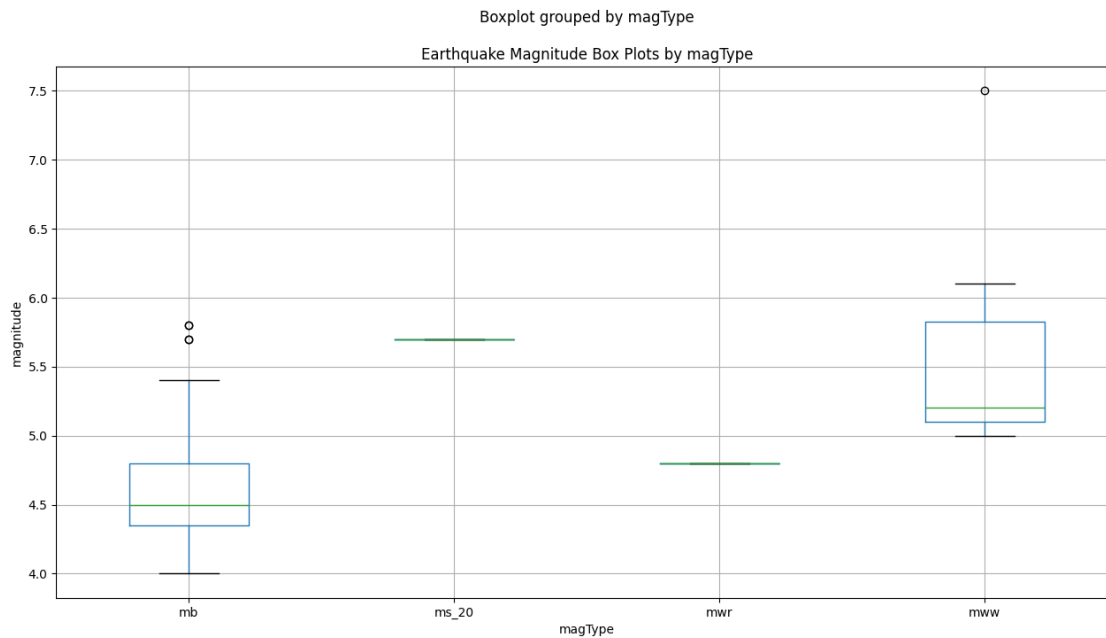
```
'Philippines', 'Haiti', 'Jamaica', 'Kentucky', 'New Zealand',
'Iran', 'Afghanistan', 'Southwest Indian Ridge', 'Saint Helena',
'Texas', 'New Caledonia', 'El Salvador',
'Central Mid-Atlantic Ridge', 'Western Xizang', 'Italy',
'Mid-Indian Ridge', 'Ascension Island', 'North Carolina',
'South Sandwich Islands', 'Saint Eustatius and Saba', 'Pakistan',
'Bolivia', 'Turkey', 'Indian Ocean Triple Junction', 'Mayotte',
'Queen Charlotte Islands', 'India', 'Arkansas', 'Guam',
'Uzbekistan', 'Prince Edward Islands', 'Martinique', 'Honduras',
'Southern East Pacific Rise', 'East Timor', 'Barbuda', 'Mauritius',
'Carlsberg Ridge', 'Greenland', 'Balleny Islands',
'Western Indian-Antarctic Ridge', 'South Carolina', 'Vermont',
'Romania', 'New Hampshire', 'Central East Pacific Rise',
'Southeast Indian Ridge', 'Kermadec Islands', 'Colorado',
'Illinois', 'Socotra', 'Azerbaijan', 'Iraq', 'Somalia',
'New Mexico'], dtype=object)
```

```
[41]: eartquake['magType'].unique()
```

```
[41]: array(['ml', 'md', 'mb', 'mww', 'mb_lg', 'mwr', 'mw', 'mh', 'ms_20',
'mwb', nan], dtype=object)
```

```
[39]: indonesia_earthquake = eartquake[eartquake['parsed_place'].str.
↳contains('Indonesia')]
indonesia_earthquake.boxplot(
    figsize=(15, 8),
    column='mag',
    by='magType'
)
plt.title('Earthquake Magnitude Box Plots by magType')
plt.ylabel('magnitude')
```

```
[39]: Text(0, 0.5, 'magnitude')
```



0.4 4. Make a line plot of the difference between the weekly maximum high price and the weekly minimum low price for Facebook. This should be a single line. (5 pts)

[42]: fb

```
[42]:
```

	open	high	low	close	volume
date					
2018-01-02	177.68	181.58	177.5500	181.42	18151903
2018-01-03	181.88	184.78	181.3300	184.67	16886563
2018-01-04	184.90	186.21	184.0996	184.33	13880896
2018-01-05	185.59	186.90	184.9300	186.85	13574535
2018-01-08	187.20	188.90	186.3300	188.28	17994726
...	...	...	...	...	...
2018-12-24	123.10	129.74	123.0200	124.06	22066002
2018-12-26	126.00	134.24	125.8900	134.18	39723370
2018-12-27	132.44	134.99	129.6700	134.52	31202509
2018-12-28	135.34	135.92	132.2000	133.20	22627569
2018-12-31	134.45	134.64	129.9500	131.09	24625308

[251 rows x 5 columns]

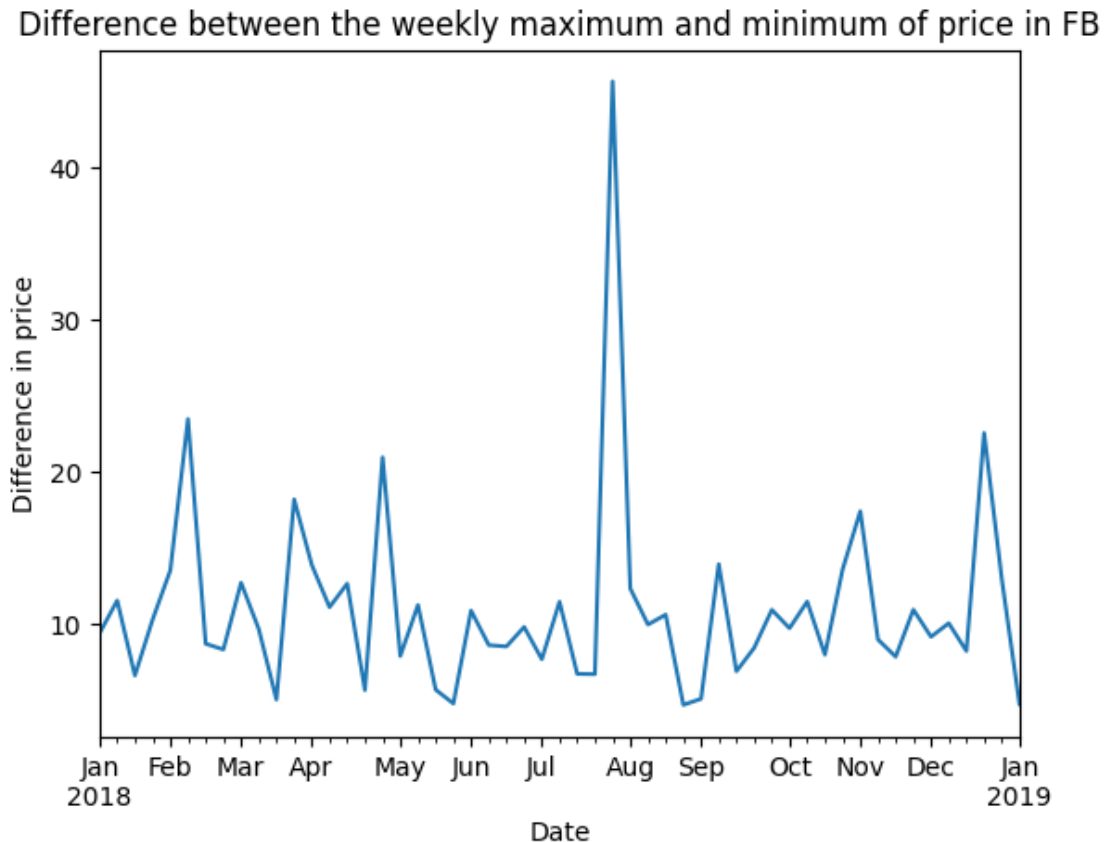
```
[45]: weekly_high = fb['high'].resample('W').max()
       weekly_low = fb['low'].resample('W').min()

       weekly_difference = weekly_high - weekly_low
```

```

weekly_difference.plot(
    title='Difference between the weekly maximum and minimum of price in FB',
    kind='line'
)
plt.xlabel('Date')
plt.ylabel('Difference in price')
plt.show()

```



**0.5 5. Using matplotlib and pandas, create two subplots side-by-side showing the effect that after-hours trading has had on Facebook's stock price: (10 pts)**

1. The first subplot will contain a line plot of the daily difference between that day's opening price and the prior day's closing price.
2. The second subplot will be a bar plot showing the net effect this had monthly, using `resample()`.
3. Bonus #1: Color the bars according to whether they are gains in the stock price (green) or drops in the stock price (red).
4. Bonus #2: Modify the x-axis of the bar plot to show the three letter abbreviation for the

month.

```
[56]: fb['Prev Close Price'] = fb['close'].shift(1)
fb['Daily Diff'] = fb['open'] - fb['Prev Close Price']

monthly_diff = fb['Daily Diff'].resample('M').sum()

fig, ax = plt.subplots(1, 2, figsize=(14, 6))

ax[0].plot(fb.index, fb['Daily Diff'], label='Daily Difference', color='blue')
ax[0].set_title('Daily Difference Between Opening and Prior Closing Prices')
ax[0].set_xlabel('Date')
ax[0].set_ylabel('Price Difference')

colors = []
for i in monthly_diff:
    if i > 0:
        colors.append('green')
    else:
        colors.append('red')

monthly_diff.plot(kind='bar', ax=ax[1], color=colors)
ax[1].set_title('Monthly Net Effect of After-Hours Trading')
ax[1].set_xlabel('Month')
ax[1].set_ylabel('Net Effect')

plt.tight_layout()
plt.show()
```

