

# Manipulação de MarketData

September 11, 2023

```
[1]: from datetime import datetime, timedelta
import pandas as pd
```

## 0.1 Fontes de dados

### 0.1.1 TVData Feed

- Github: <https://github.com/StreamAlpha/tvdatafeed>
- TradingView: <https://br.tradingview.com/chart/mrXhbdac/>

```
[21]: from tvDatafeed import TvDatafeed, Interval

username = 'rodrigo.tadewald'
password = open('pass', 'r').read()

tv = TvDatafeed(username, password)
```

```
[22]: # Procurando por símbolos
symbols = tv.search_symbol('PETR4', 'BMFBOVESPA')
```

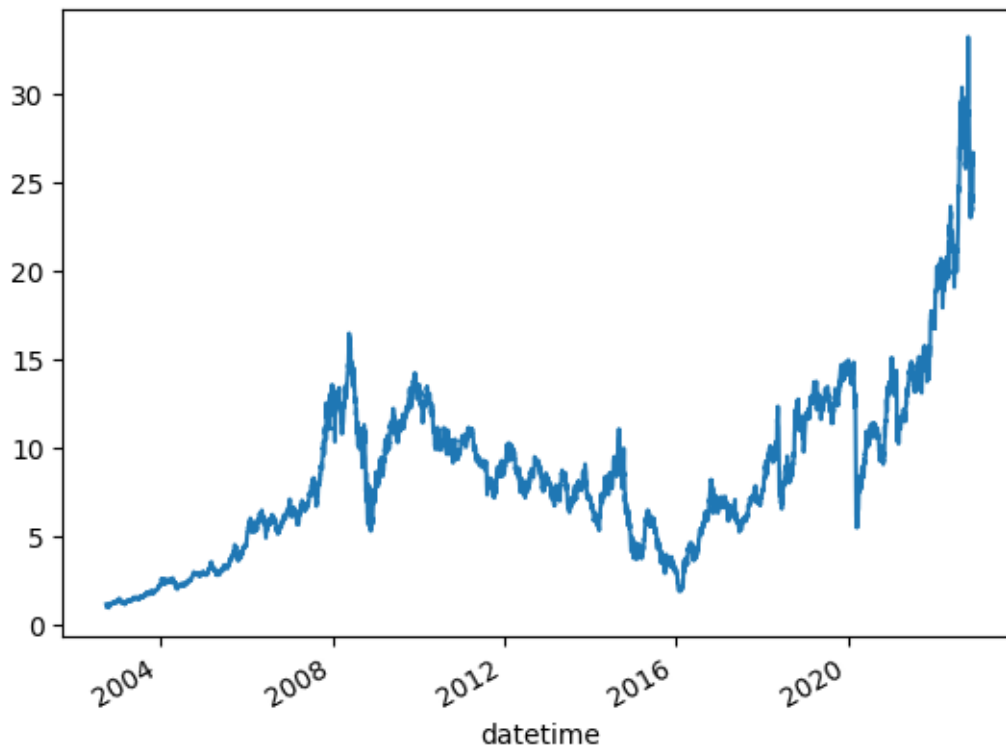
```
[23]: # Obtendo dados

# No campo Interval, utilizar um entre:
'''Interval.in_1_minute
Interval.in_3_minute
Interval.in_5_minute
Interval.in_15_minute
Interval.in_30_minute
Interval.in_45_minute
Interval.in_1_hour
Interval.in_2_hour
Interval.in_3_hour
Interval.in_4_hour
Interval.in_daily
Interval.in_weekly
Interval.in_monthly'''
```

```
df_intraday = tv.  
    ↪get_hist(symbol='PETR4',exchange='BMFBOVESPA',interval=Interval.in_5_minute,↪  
    ↪n_bars= 5000)  
df_daily = tv.get_hist(symbol='PETR4',exchange='BMFBOVESPA',interval=Interval.  
    ↪in_daily, n_bars= 5000)
```

```
[24]: df_daily["close"].plot()
```

```
[24]: <AxesSubplot: xlabel='datetime'>
```



```
[7]: df_mglu3 = tv.get_hist(symbol='MGLU3',exchange='BMFBOVESPA',interval=Interval.  
    ↪in_daily, n_bars= 5000)
```

### 0.1.2 Yahoo Finance

```
[1]: import yfinance as yf
```

```
[2]: petr = yf.Ticker("PETR4.SA")
```

```
[ ]: interval = "1m",
```

```
[18]: # get historical market data
```

```
# fetch data by interval (including intraday if period < 60 days)
# valid intervals: 1m,2m,5m,15m,30m,60m,90m,1h,1d,5d,1wk,1mo,3mo
# (optional, default is '1d')
```

```
hist = petr.history(period="max", interval = "1m")
```

```
[4]: # get stock info
```

```
petr.info
```

```
[4]: {'zip': '20031-912',
      'sector': 'Energy',
      'fullTimeEmployees': 45532,
      'longBusinessSummary': 'Petróleo Brasileiro S.A. - Petrobras explores for, produces, and sells oil and gas in Brazil and internationally. The company operates through Exploration and Production; Refining, Transportation and Marketing; Gas and Power; and Corporate and Other Businesses segments. It engages in prospecting, drilling, refining, processing, trading, and transporting crude oil from producing onshore and offshore oil fields, and shale or other rocks, as well as oil products, natural gas, and other liquid hydrocarbons. The Exploration and Production segment explores, develops, and produces crude oil, natural gas liquids, and natural gas primarily for supplies to the domestic refineries. The Refining, Transportation and Marketing segment engages in the refining, logistics, transport, marketing, and trading of crude oil and oil products; exportation of ethanol; and extraction and processing of shale, as well as holding interests in petrochemical companies. The Gas and Power segment is involved in the logistic and trading of natural gas and electricity; transportation and trading of LNG; generation of electricity through thermoelectric power plants; holding interests in transportation and distribution of natural gas; and fertilizer production and natural gas processing business. The Corporate and Other Businesses segment produces biodiesel and its co-products, and ethanol; and distributes oil products. Petróleo Brasileiro S.A. - Petrobras was incorporated in 1953 and is headquartered in Rio de Janeiro, Brazil.',
      'city': 'Rio De Janeiro',
      'phone': '55 21 3224 4477',
      'state': 'RJ',
      'country': 'Brazil',
      'companyOfficers': [],
      'website': 'https://petrobras.com.br',
      'maxAge': 1,
      'address1': 'Avenida RepUblica do Chile, 65',
      'industry': 'Oil & Gas Integrated',
      'address2': 'Centro',
      'ebitdaMargins': 0.54855,
      'profitMargins': 0.29471,
```

'grossMargins': 0.52852,  
 'operatingCashflow': 239226994688,  
 'revenueGrowth': 0.421,  
 'operatingMargins': 0.47542998,  
 'ebitda': 328504999936,  
 'targetLowPrice': 16.75,  
 'recommendationKey': 'hold',  
 'grossProfits': 219637000000,  
 'freeCashflow': 178030624768,  
 'targetMedianPrice': 37.5,  
 'currentPrice': 26.31,  
 'earningsGrowth': 0.48,  
 'currentRatio': 1.173,  
 'returnOnAssets': 0.18514,  
 'numberOfAnalystOpinions': 10,  
 'targetMeanPrice': 36.7,  
 'debtToEquity': 78.428,  
 'returnOnEquity': 0.47272998,  
 'targetHighPrice': 53,  
 'totalCash': 36687998976,  
 'totalDebt': 293403000832,  
 'totalRevenue': 598854991872,  
 'totalCashPerShare': 2.813,  
 'financialCurrency': 'BRL',  
 'revenuePerShare': 45.91,  
 'quickRatio': 0.489,  
 'recommendationMean': 2.8,  
 'exchange': 'SAO',  
 'shortName': 'PETROBRAS PN N2',  
 'longName': 'Petróleo Brasileiro S.A. - Petrobras',  
 'exchangeTimezoneName': 'America/Sao\_Paulo',  
 'exchangeTimezoneShortName': 'BRST',  
 'isEsgPopulated': False,  
 'gmtOffsetMilliseconds': '-7200000',  
 'quoteType': 'EQUITY',  
 'symbol': 'PETR4.SA',  
 'messageBoardId': 'finmb\_409268',  
 'market': 'br\_market',  
 'annualHoldingsTurnover': None,  
 'enterpriseToRevenue': 0.962,  
 'beta3Year': None,  
 'enterpriseToEbitda': 1.754,  
 '52WeekChange': -0.105077565,  
 'morningStarRiskRating': None,  
 'forwardEps': 10.1,  
 'revenueQuarterlyGrowth': None,  
 'sharesOutstanding': 5601970176,

'fundInceptionDate': None,  
 'annualReportExpenseRatio': None,  
 'totalAssets': None,  
 'bookValue': 28.557,  
 'sharesShort': None,  
 'sharesPercentSharesOut': None,  
 'fundFamily': None,  
 'lastFiscalYearEnd': 1640908800,  
 'heldPercentInstitutions': 0.33678,  
 'netIncomeToCommon': 176491003904,  
 'trailingEps': 14.12,  
 'lastDividendValue': 3.3489,  
 'SandP52WeekChange': -0.10858184,  
 'priceToBook': 0.92131525,  
 'heldPercentInsiders': 0.16073999,  
 'nextFiscalYearEnd': 1703980800,  
 'yield': None,  
 'mostRecentQuarter': 1664496000,  
 'shortRatio': None,  
 'sharesShortPreviousMonthDate': None,  
 'floatShares': 8268327853,  
 'beta': 1.330332,  
 'enterpriseValue': 576078741504,  
 'priceHint': 2,  
 'threeYearAverageReturn': None,  
 'lastSplitDate': 1209340800,  
 'lastSplitFactor': '2:1',  
 'legalType': None,  
 'lastDividendDate': 1669075200,  
 'morningStarOverallRating': None,  
 'earningsQuarterlyGrowth': 0.48,  
 'priceToSalesTrailing12Months': 0.6242208,  
 'dateShortInterest': None,  
 'pegRatio': 0.08,  
 'ytdReturn': None,  
 'forwardPE': 2.6049504,  
 'lastCapGain': None,  
 'shortPercentOfFloat': None,  
 'sharesShortPriorMonth': None,  
 'impliedSharesOutstanding': 0,  
 'category': None,  
 'fiveYearAverageReturn': None,  
 'previousClose': 26.66,  
 'regularMarketOpen': 26.58,  
 'twoHundredDayAverage': 31.22385,  
 'trailingAnnualDividendYield': 0.19819956,  
 'payoutRatio': 1.2551999,

```

'volume24Hr': None,
'regularMarketDayHigh': 26.79,
'navPrice': None,
'averageDailyVolume10Day': 102632450,
'regularMarketPreviousClose': 26.66,
'fiftyDayAverage': 30.0744,
'trailingAnnualDividendRate': 5.284,
'open': 26.58,
'toCurrency': None,
'averageVolume10days': 102632450,
'expireDate': None,
'algorith': None,
'dividendRate': 20.02,
'exDividendDate': 1669075200,
'circulatingSupply': None,
'startDate': None,
'regularMarketDayLow': 26.17,
'currency': 'BRL',
'trailingPE': 1.8633144,
'regularMarketVolume': 6581400,
'lastMarket': None,
'maxSupply': None,
'openInterest': None,
'marketCap': 373817737216,
'volumeAllCurrencies': None,
'strikePrice': None,
'averageVolume': 101063055,
'dayLow': 26.17,
'ask': 26.32,
'askSize': 0,
'volume': 6581400,
'fiftyTwoWeekHigh': 38.39,
'fromCurrency': None,
'fiveYearAvgDividendYield': None,
'fiftyTwoWeekLow': 22.3,
'bid': 26.3,
'tradeable': False,
'dividendYield': 0.8217,
'bidSize': 0,
'dayHigh': 26.79,
'coinMarketCapLink': None,
'regularMarketPrice': 26.31,
'preMarketPrice': None,
'logo_url': 'https://logo.clearbit.com/petrobras.com.br',
'trailingPegRatio': 1.4193}

```

```
[6]: # show actions (dividends, splits)
petr.actions
```

```
[6]:
```

Date	Dividends	Stock Splits
2005-04-01 00:00:00-03:00	0.133288	0.0
2005-07-01 00:00:00-03:00	0.250663	0.0
2005-09-01 00:00:00-03:00	0.000000	4.0
2006-01-02 00:00:00-02:00	0.259000	0.0
2006-04-04 00:00:00-03:00	0.132700	0.0
2006-11-01 00:00:00-03:00	0.500750	0.0
2007-01-02 00:00:00-02:00	0.225000	0.0
2007-04-03 00:00:00-03:00	0.175000	0.0
2007-08-20 00:00:00-03:00	0.251700	0.0
2007-10-08 00:00:00-03:00	0.256500	0.0
2008-01-14 00:00:00-02:00	0.155300	0.0
2008-04-07 00:00:00-03:00	0.102600	0.0
2008-04-28 00:00:00-03:00	0.000000	2.0
2008-12-29 00:00:00-02:00	0.042600	0.0
2009-04-09 00:00:00-03:00	0.351600	0.0
2009-07-06 00:00:00-03:00	0.300000	0.0
2009-10-01 00:00:00-03:00	0.200000	0.0
2009-12-21 00:00:00-02:00	0.200000	0.0
2010-04-23 00:00:00-03:00	0.133200	0.0
2010-05-24 00:00:00-03:00	0.170000	0.0
2010-08-02 00:00:00-03:00	0.170000	0.0
2010-11-03 00:00:00-02:00	0.140000	0.0
2010-12-22 00:00:00-02:00	0.200000	0.0
2011-03-22 00:00:00-03:00	0.173420	0.0
2011-04-29 00:00:00-03:00	0.126500	0.0
2011-05-12 00:00:00-03:00	0.213600	0.0
2011-08-03 00:00:00-03:00	0.207300	0.0
2011-11-14 00:00:00-02:00	0.200000	0.0
2012-01-03 00:00:00-02:00	0.177300	0.0
2012-03-20 00:00:00-03:00	0.124400	0.0
2012-05-14 00:00:00-03:00	0.200000	0.0
2013-04-30 00:00:00-03:00	0.386170	0.0
2014-04-03 00:00:00-03:00	0.967200	0.0
2018-05-22 00:00:00-03:00	0.050000	0.0
2018-08-14 00:00:00-03:00	0.050000	0.0
2018-11-22 00:00:00-02:00	0.100000	0.0
2018-12-26 00:00:00-02:00	0.716563	0.0
2019-04-26 00:00:00-03:00	0.019494	0.0
2019-05-22 00:00:00-03:00	0.100000	0.0
2019-08-13 00:00:00-03:00	0.200000	0.0
2019-11-12 00:00:00-03:00	0.200925	0.0
2019-12-27 00:00:00-03:00	0.421942	0.0

2020-04-23 00:00:00-03:00	0.000449	0.0
2020-04-28 00:00:00-03:00	0.000449	0.0
2020-07-23 00:00:00-03:00	0.000461	0.0
2021-04-15 00:00:00-03:00	0.792834	0.0
2021-08-17 00:00:00-03:00	1.609911	0.0
2021-12-02 00:00:00-03:00	3.250487	0.0
2022-04-14 00:00:00-03:00	2.970249	0.0
2022-05-24 00:00:00-03:00	3.715490	0.0
2022-08-12 00:00:00-03:00	6.732003	0.0
2022-11-22 00:00:00-03:00	3.348900	0.0

```
[7]: # show dividends
      petr.dividends
```

```
[7]: Date
      2005-04-01 00:00:00-03:00    0.133288
      2005-07-01 00:00:00-03:00    0.250663
      2006-01-02 00:00:00-02:00    0.259000
      2006-04-04 00:00:00-03:00    0.132700
      2006-11-01 00:00:00-03:00    0.500750
      2007-01-02 00:00:00-02:00    0.225000
      2007-04-03 00:00:00-03:00    0.175000
      2007-08-20 00:00:00-03:00    0.251700
      2007-10-08 00:00:00-03:00    0.256500
      2008-01-14 00:00:00-02:00    0.155300
      2008-04-07 00:00:00-03:00    0.102600
      2008-12-29 00:00:00-02:00    0.042600
      2009-04-09 00:00:00-03:00    0.351600
      2009-07-06 00:00:00-03:00    0.300000
      2009-10-01 00:00:00-03:00    0.200000
      2009-12-21 00:00:00-02:00    0.200000
      2010-04-23 00:00:00-03:00    0.133200
      2010-05-24 00:00:00-03:00    0.170000
      2010-08-02 00:00:00-03:00    0.170000
      2010-11-03 00:00:00-02:00    0.140000
      2010-12-22 00:00:00-02:00    0.200000
      2011-03-22 00:00:00-03:00    0.173420
      2011-04-29 00:00:00-03:00    0.126500
      2011-05-12 00:00:00-03:00    0.213600
      2011-08-03 00:00:00-03:00    0.207300
      2011-11-14 00:00:00-02:00    0.200000
      2012-01-03 00:00:00-02:00    0.177300
      2012-03-20 00:00:00-03:00    0.124400
      2012-05-14 00:00:00-03:00    0.200000
      2013-04-30 00:00:00-03:00    0.386170
      2014-04-03 00:00:00-03:00    0.967200
      2018-05-22 00:00:00-03:00    0.050000
```



```

2018-08-14 00:00:00-03:00    0.050000
2018-11-22 00:00:00-02:00    0.100000
2018-12-26 00:00:00-02:00    0.716563
2019-04-26 00:00:00-03:00    0.019494
2019-05-22 00:00:00-03:00    0.100000
2019-08-13 00:00:00-03:00    0.200000
2019-11-12 00:00:00-03:00    0.200925
2019-12-27 00:00:00-03:00    0.421942
2020-04-23 00:00:00-03:00    0.000449
2020-04-28 00:00:00-03:00    0.000449
2020-07-23 00:00:00-03:00    0.000461
2021-04-15 00:00:00-03:00    0.792834
2021-08-17 00:00:00-03:00    1.609911
2021-12-02 00:00:00-03:00    3.250487
2022-04-14 00:00:00-03:00    2.970249
2022-05-24 00:00:00-03:00    3.715490
2022-08-12 00:00:00-03:00    6.732003
2022-11-22 00:00:00-03:00    3.348900
Name: Dividends, dtype: float64

```

```

[8]: # show splits
      petr.splits

```

```

[8]: Date
      2005-09-01 00:00:00-03:00    4.0
      2008-04-28 00:00:00-03:00    2.0
      Name: Stock Splits, dtype: float64

```

```

[9]: # show financials
      petr.financials
      petr.quarterly_financials

```

```

[9]:
      2022-09-30    2022-06-30  \
Research Development    984000000.0    1080000000.0
Effect Of Accounting Charges          None          None
Income Before Tax    66639000000.0    80677000000.0
Minority Interest    1607000000.0    2307000000.0
Net Income    46096000000.0    54330000000.0
Selling General Administrative    811000000.0    758000000.0
Gross Profit    86836000000.0    95861000000.0
Ebit    76385000000.0    99070000000.0
Operating Income    76385000000.0    99070000000.0
Other Operating Expenses    792000000.0   -12365000000.0
Interest Expense   -1599000000.0   -406000000.0
Extraordinary Items          None          None
Non Recurring          None          None
Other Items          None          None

```

Income Tax Expense	20403000000.0	26193000000.0
Total Revenue	150641000000.0	129986000000.0
Total Operating Expenses	74256000000.0	30916000000.0
Cost Of Revenue	63805000000.0	34125000000.0
Total Other Income Expense Net	-9746000000.0	-18393000000.0
Discontinued Operations	None	None
Net Income From Continuing Ops	46236000000.0	54484000000.0
Net Income Applicable To Common Shares	46096000000.0	54330000000.0

	2022-03-31	2021-12-31
Research Development	1081000000.0	827000000.0
Effect Of Accounting Charges	None	None
Income Before Tax	68381000000.0	44485000000.0
Minority Interest	2867000000.0	2252000000.0
Net Income	44561000000.0	31504000000.0
Selling General Administrative	7718000000.0	7810000000.0
Gross Profit	74766000000.0	59047000000.0
Ebit	61213000000.0	49577000000.0
Operating Income	61213000000.0	49577000000.0
Other Operating Expenses	4346000000.0	431000000.0
Interest Expense	-3066000000.0	-8356000000.0
Extraordinary Items	None	None
Non Recurring	None	None
Other Items	None	None
Income Tax Expense	23598000000.0	12762000000.0
Total Revenue	141641000000.0	176587000000.0
Total Operating Expenses	80428000000.0	127010000000.0
Cost Of Revenue	66875000000.0	117540000000.0
Total Other Income Expense Net	7168000000.0	-5092000000.0
Discontinued Operations	None	None
Net Income From Continuing Ops	44783000000.0	31723000000.0
Net Income Applicable To Common Shares	44561000000.0	31504000000.0

```
[11]: # show major holders
petr.major_holders
```

```
[11]:      0      1
0  16.07%    % of Shares Held by All Insider
1  33.68%    % of Shares Held by Institutions
2  40.13%    % of Float Held by Institutions
3    519  Number of Institutions Holding Shares
```

```
[12]: # show institutional holders
petr.institutional_holders
```

```
[13]: # show balance sheet
petr.balance_sheet
```

petr.quarterly\_balance\_sheet

[13]:	2022-09-30	2022-06-30 \
Intangible Assets	1.529900e+10	1.691900e+10
Total Liab	5.734690e+11	5.919020e+11
Total Stockholder Equity	3.724980e+11	4.105450e+11
Minority Interest	1.607000e+09	2.307000e+09
Other Current Liab	3.393900e+10	6.340900e+10
Total Assets	9.475740e+11	1.004754e+12
Common Stock	2.054320e+11	2.054320e+11
Other Current Assets	4.002500e+10	4.157600e+10
Retained Earnings	1.334520e+11	1.772550e+11
Other Liab	1.909870e+11	1.890310e+11
Good Will	1.230000e+08	1.230000e+08
Gains Losses Not Affecting Retained Earnings	3.361400e+10	2.785800e+10
Other Assets	9.245300e+10	8.625400e+10
Cash	2.365000e+10	8.531100e+10
Total Current Liabilities	1.358070e+11	1.711570e+11
Deferred Long Term Asset Charges	2.673000e+09	2.869000e+09
Short Long Term Debt	1.787300e+10	2.156000e+10
Other Stockholder Equity	3.361400e+10	2.785800e+10
Property Plant Equipment	6.710670e+11	6.674230e+11
Total Current Assets	1.593270e+11	2.247850e+11
Long Term Investments	9.305000e+09	9.250000e+09
Net Tangible Assets	3.570760e+11	3.935030e+11
Short Term Investments	1.303800e+10	1.495700e+10
Net Receivables	2.978900e+10	3.311900e+10
Long Term Debt	1.489450e+11	1.410840e+11
Inventory	5.282500e+10	4.982200e+10
Accounts Payable	2.816400e+10	2.895400e+10
	2022-03-31	2021-12-31
Intangible Assets	1.684400e+10	1.675600e+10
Total Liab	5.616010e+11	5.833700e+11
Total Stockholder Equity	4.341940e+11	3.873290e+11
Minority Interest	2.867000e+09	2.252000e+09
Other Current Liab	2.537200e+10	2.000400e+10
Total Assets	9.986620e+11	9.729510e+11
Common Stock	2.054320e+11	2.054320e+11
Other Current Assets	3.056900e+10	2.267200e+10
Retained Earnings	2.088050e+11	1.642440e+11
Other Liab	1.972790e+11	1.712700e+11
Good Will	1.220000e+08	1.230000e+08
Gains Losses Not Affecting Retained Earnings	1.995700e+10	1.765300e+10
Other Assets	8.527500e+10	7.974500e+10
Cash	8.160100e+10	5.841000e+10
Total Current Liabilities	1.302220e+11	1.349130e+11

Deferred Long Term Asset Charges	2.962000e+09	3.371000e+09
Short Long Term Debt	1.795700e+10	2.031600e+10
Other Stockholder Equity	1.995700e+10	1.765300e+10
Property Plant Equipment	6.870510e+11	6.994060e+11
Total Current Assets	1.995120e+11	1.682470e+11
Long Term Investments	9.858000e+09	8.674000e+09
Net Tangible Assets	4.172280e+11	3.704500e+11
Short Term Investments	5.967000e+09	NaN
Net Receivables	3.302400e+10	4.304900e+10
Long Term Debt	1.498620e+11	1.789080e+11
Inventory	4.835100e+10	4.048600e+10
Accounts Payable	2.802900e+10	3.059700e+10

```
[14]: # show cashflow
      petr.cashflow
      petr.quarterly_cashflow
```

```
[14]:
```

	2022-09-30	2022-06-30	\
Investments	2.579000e+09	-8.140000e+09	
Change To Liabilities	-1.048000e+09	1.750000e+08	
Total Cashflows From Investing Activities	-3.823000e+09	1.672700e+10	
Net Borrowings	-7.492000e+09	-2.519100e+10	
Total Cash From Financing Activities	-1.210130e+11	-8.970500e+10	
Change To Operating Activities	3.772900e+10	-2.853000e+09	
Net Income	4.609600e+10	5.433000e+10	
Change In Cash	-6.169800e+10	3.707000e+09	
Effect Of Exchange Rate	-6.900000e+07	4.881000e+09	
Total Cash From Operating Activities	6.320700e+10	7.180400e+10	
Depreciation	1.722500e+10	1.740300e+10	
Other Cashflows From Investing Activities	1.052000e+09	2.545000e+10	
Dividends Paid	-1.110460e+11	-6.202700e+10	
Change To Inventory	-3.007000e+09	-4.890000e+08	
Change To Account Receivables	3.576000e+09	-2.876000e+09	
Other Cashflows From Financing Activities	-2.475000e+09	-2.487000e+09	
Change To Netincome	1.640300e+10	3.118000e+09	
Capital Expenditures	-1.032600e+10	-8.383000e+09	

	2022-03-31	2021-12-31
Investments	-2.494000e+09	-7.590000e+08
Change To Liabilities	-1.267000e+09	1.208000e+09
Total Cashflows From Investing Activities	-4.983000e+09	3.108000e+09
Net Borrowings	-1.381700e+10	-1.250100e+10
Total Cash From Financing Activities	-1.645500e+10	-5.573200e+10
Change To Operating Activities	-1.160900e+10	-2.821800e+10
Net Income	4.456100e+10	3.150400e+10
Change In Cash	2.315900e+10	-9.440000e+08
Effect Of Exchange Rate	-8.227000e+09	2.880000e+08

Total Cash From Operating Activities	5.282400e+10	5.139200e+10
Depreciation	1.662900e+10	1.590800e+10
Other Cashflows From Investing Activities	5.940000e+08	2.752000e+09
Dividends Paid	-2.000000e+06	-4.097600e+10
Change To Inventory	-9.763000e+09	-8.870000e+08
Change To Account Receivables	3.123000e+09	-3.279000e+09
Other Cashflows From Financing Activities	-2.636000e+09	-2.255000e+09
Change To Netincome	4.967000e+09	4.182000e+09
Capital Expenditures	-1.233800e+10	-9.326000e+09

### 0.1.3 MetaTrader 5

```
[13]: !pip3 install MetaTrader5
```

```
ERROR: Could not find a version that satisfies the requirement MetaTrader5
```

```
(from versions: none)
```

```
ERROR: No matching distribution found for MetaTrader5
```

```
[notice] A new release of pip
```

```
available: 22.2.2 -> 22.3.1
```

```
[notice] To update, run:
```

```
python3.10 -m pip install --upgrade pip
```

## 0.2 Manipulando dados

```
[5]: df_intraday = pd.read_csv("tvfeed_petr4.csv")
df_intraday.set_index("datetime", inplace=True)
```

```
[15]: df_intraday.index = pd.to_datetime(df_intraday.index)
```

### 0.2.1 1. Filtros em séries temporais

```
[22]: df_intraday.index.date
```

```
[22]: array([datetime.date(2022, 9, 12), datetime.date(2022, 9, 12),
          datetime.date(2022, 9, 12), ..., datetime.date(2022, 12, 1),
          datetime.date(2022, 12, 1), datetime.date(2022, 12, 1)],
          dtype=object)
```

```
[25]: df_intraday[df_intraday.index.date == datetime.today().date()]
```

```
[25]:
```

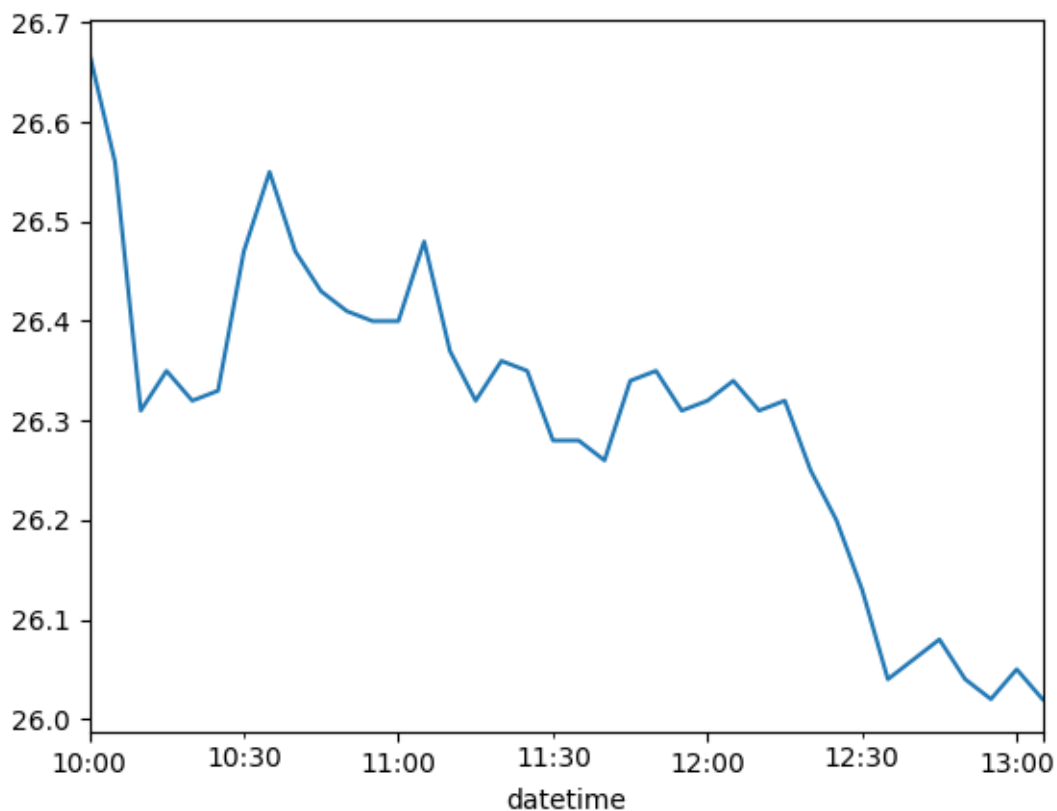
	symbol	open	high	low	close	volume
datetime						
2022-12-01 10:00:00	BMFBOVESPA:PETR4	26.58	26.68	26.54	26.67	863600.0
2022-12-01 10:05:00	BMFBOVESPA:PETR4	26.67	26.79	26.55	26.56	2087900.0

2022-12-01	10:10:00	BMFBOVESPA:PETR4	26.55	26.56	26.31	26.31	1712900.0
2022-12-01	10:15:00	BMFBOVESPA:PETR4	26.31	26.37	26.17	26.35	1470300.0
2022-12-01	10:20:00	BMFBOVESPA:PETR4	26.35	26.38	26.28	26.32	612400.0
2022-12-01	10:25:00	BMFBOVESPA:PETR4	26.32	26.40	26.25	26.33	723600.0
2022-12-01	10:30:00	BMFBOVESPA:PETR4	26.33	26.58	26.29	26.47	1340000.0
2022-12-01	10:35:00	BMFBOVESPA:PETR4	26.48	26.61	26.42	26.55	800500.0
2022-12-01	10:40:00	BMFBOVESPA:PETR4	26.55	26.64	26.45	26.47	868100.0
2022-12-01	10:45:00	BMFBOVESPA:PETR4	26.47	26.55	26.41	26.43	765100.0
2022-12-01	10:50:00	BMFBOVESPA:PETR4	26.41	26.45	26.36	26.41	432800.0
2022-12-01	10:55:00	BMFBOVESPA:PETR4	26.42	26.51	26.37	26.40	416400.0
2022-12-01	11:00:00	BMFBOVESPA:PETR4	26.41	26.44	26.37	26.40	181400.0
2022-12-01	11:05:00	BMFBOVESPA:PETR4	26.39	26.52	26.39	26.48	646000.0
2022-12-01	11:10:00	BMFBOVESPA:PETR4	26.49	26.50	26.35	26.37	458200.0
2022-12-01	11:15:00	BMFBOVESPA:PETR4	26.37	26.38	26.26	26.32	851600.0
2022-12-01	11:20:00	BMFBOVESPA:PETR4	26.33	26.39	26.32	26.36	469200.0
2022-12-01	11:25:00	BMFBOVESPA:PETR4	26.35	26.41	26.35	26.35	696500.0
2022-12-01	11:30:00	BMFBOVESPA:PETR4	26.35	26.46	26.23	26.28	1190200.0
2022-12-01	11:35:00	BMFBOVESPA:PETR4	26.29	26.37	26.23	26.28	687300.0
2022-12-01	11:40:00	BMFBOVESPA:PETR4	26.28	26.34	26.25	26.26	343500.0
2022-12-01	11:45:00	BMFBOVESPA:PETR4	26.26	26.35	26.25	26.34	587400.0
2022-12-01	11:50:00	BMFBOVESPA:PETR4	26.34	26.40	26.32	26.35	591200.0
2022-12-01	11:55:00	BMFBOVESPA:PETR4	26.36	26.39	26.28	26.31	442600.0
2022-12-01	12:00:00	BMFBOVESPA:PETR4	26.32	26.34	26.25	26.32	681700.0
2022-12-01	12:05:00	BMFBOVESPA:PETR4	26.33	26.37	26.29	26.34	488000.0
2022-12-01	12:10:00	BMFBOVESPA:PETR4	26.33	26.37	26.28	26.31	660200.0
2022-12-01	12:15:00	BMFBOVESPA:PETR4	26.30	26.33	26.26	26.32	498300.0
2022-12-01	12:20:00	BMFBOVESPA:PETR4	26.32	26.34	26.23	26.25	643400.0
2022-12-01	12:25:00	BMFBOVESPA:PETR4	26.25	26.28	26.20	26.20	773300.0
2022-12-01	12:30:00	BMFBOVESPA:PETR4	26.20	26.21	26.12	26.13	1147100.0
2022-12-01	12:35:00	BMFBOVESPA:PETR4	26.13	26.13	26.01	26.04	1332300.0
2022-12-01	12:40:00	BMFBOVESPA:PETR4	26.03	26.08	25.96	26.06	962500.0
2022-12-01	12:45:00	BMFBOVESPA:PETR4	26.06	26.11	26.01	26.08	481800.0
2022-12-01	12:50:00	BMFBOVESPA:PETR4	26.08	26.08	25.95	26.04	692700.0
2022-12-01	12:55:00	BMFBOVESPA:PETR4	26.04	26.05	25.98	26.02	363100.0
2022-12-01	13:00:00	BMFBOVESPA:PETR4	26.02	26.08	25.98	26.05	449300.0
2022-12-01	13:05:00	BMFBOVESPA:PETR4	26.06	26.06	25.99	26.02	225000.0

```
[30]: # Filtrando apenas dados do dia
df_today = df_intraday[df_intraday.index.date == datetime.today().date()]
```

```
[29]: df_today["close"].plot()
```

```
[29]: <AxesSubplot: xlabel='datetime'>
```



```
[42]: # Filtro em determinada janela temporal
d0 = datetime(2022, 11, 1)
d1 = datetime(2022, 11, 15)

df_slice = df_intraday[(df_intraday.index>= d0) & (df_intraday.index<= d1)]
```

```
[44]: # Filtro temporal dinâmico
d1 = datetime.today()
d0 = d1 - timedelta(days=10)

df_slice = df_intraday[(df_intraday.index >= d0) & (df_intraday.index <= d1)]
```

```
[45]: df_slice
```

```
[45]:
```

datetime	symbol	open	high	low	\
2022-11-21 14:40:00	BMFBOVESPA:PETR4	23.622537	23.692921	23.622537	
2022-11-21 14:45:00	BMFBOVESPA:PETR4	23.631335	23.666527	23.578548	
2022-11-21 14:50:00	BMFBOVESPA:PETR4	23.578548	23.622537	23.552154	
2022-11-21 14:55:00	BMFBOVESPA:PETR4	23.569750	23.684123	23.569750	
2022-11-21 15:00:00	BMFBOVESPA:PETR4	23.666527	23.736911	23.657729	

```

...
2022-12-01 12:45:00 BMFBOVESPA:PETR4 26.060000 26.110000 26.010000
2022-12-01 12:50:00 BMFBOVESPA:PETR4 26.080000 26.080000 25.950000
2022-12-01 12:55:00 BMFBOVESPA:PETR4 26.040000 26.050000 25.980000
2022-12-01 13:00:00 BMFBOVESPA:PETR4 26.020000 26.080000 25.980000
2022-12-01 13:05:00 BMFBOVESPA:PETR4 26.060000 26.060000 25.990000

```

```

                                close    volume
datetime
2022-11-21 14:40:00 23.640133 435438.0
2022-11-21 14:45:00 23.578548 2198347.0
2022-11-21 14:50:00 23.578548 960333.0
2022-11-21 14:55:00 23.684123 1819168.0
2022-11-21 15:00:00 23.701719 1096843.0
...
2022-12-01 12:45:00 26.080000 481800.0
2022-12-01 12:50:00 26.040000 692700.0
2022-12-01 12:55:00 26.020000 363100.0
2022-12-01 13:00:00 26.050000 449300.0
2022-12-01 13:05:00 26.020000 225000.0

```

[736 rows x 6 columns]

## 0.2.2 2. Operações em séries temporais com Rolling

```
[50]: df_today["close"].rolling(window=10).sum()
```

```
[50]: datetime
2022-09-12 12:00:00      NaN
2022-09-12 12:05:00      NaN
2022-09-12 12:10:00      NaN
2022-09-12 12:15:00      NaN
2022-09-12 12:20:00      NaN
...
2022-12-01 12:45:00    262.05
2022-12-01 12:50:00    261.77
2022-12-01 12:55:00    261.45
2022-12-01 13:00:00    261.19
2022-12-01 13:05:00    260.89
Name: close, Length: 5000, dtype: float64
```

```
[69]: import matplotlib.pyplot as plt
df_today["rolling_mean"] = df_today["close"].rolling(window=5).mean()

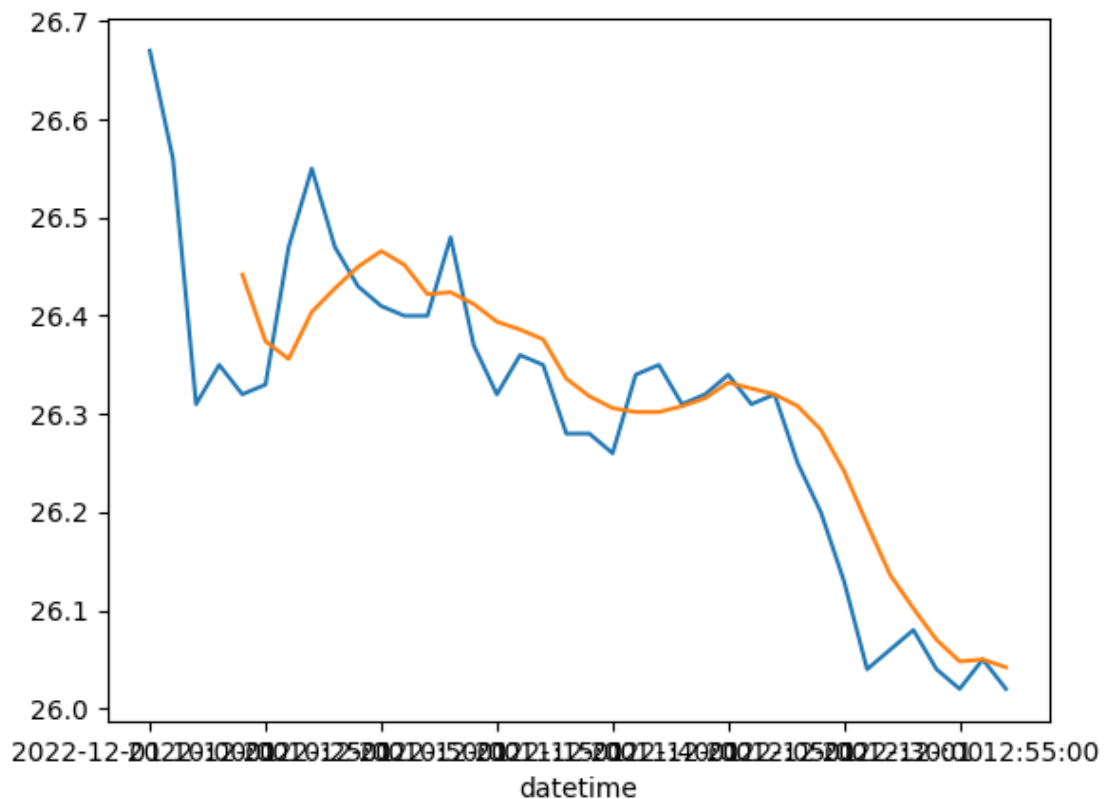
plt.plot()
df_today["close"].plot()
df_today["rolling_mean"].plot()
```



```
/var/folders/kw/n8n0bt7j6412ks58wzrzvvnw0000gn/T/ipykernel_1741/3860545678.py:2:
SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead
```

```
See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user\_guide/indexing.html#returning-a-view-versus-a-copy
df_today["rolling_mean"] = df_today["close"].rolling(window=5).mean()
```

```
[69]: <AxesSubplot: xlabel='datetime'>
```



## 0.3 Estratégias de armazenamento

### 0.3.1 1. Arquivos CSV

```
[86]: df_intraday.to_csv("df_intra.csv", sep=",")
```

```
[81]: df_petr4 = pd.read_csv("petr4_ticks.csv", sep=";", decimal=".", index_col=0,
    ↪ parse_dates=True)
```

### 0.3.2 2. ParquetFiles

```
[90]: import pyarrow as pa
import pyarrow.parquet as pq
```

### 0.3.3 Writer

```
[94]: table = pa.Table.from_pandas(df_intraday)
writer = pq.ParquetWriter("petr4.parquet", table.schema)

writer.write_table(table)
writer.close()
```

### 0.3.4 Reader

```
[97]: pq.ParquetFile("petr4.parquet").read().to_pandas()
```

```
[97]:
```

		symbol	open	high	low \
datetime					
2022-09-12	12:00:00	BMFBOVESPA:PETR4	27.959934	27.968732	27.854359
2022-09-12	12:05:00	BMFBOVESPA:PETR4	27.907147	27.959934	27.880753
2022-09-12	12:10:00	BMFBOVESPA:PETR4	27.942338	28.047914	27.924742
2022-09-12	12:15:00	BMFBOVESPA:PETR4	28.030318	28.030318	27.933540
2022-09-12	12:20:00	BMFBOVESPA:PETR4	28.003924	28.003924	27.933540
...		...	...	...	...
2022-12-01	12:45:00	BMFBOVESPA:PETR4	26.060000	26.110000	26.010000
2022-12-01	12:50:00	BMFBOVESPA:PETR4	26.080000	26.080000	25.950000
2022-12-01	12:55:00	BMFBOVESPA:PETR4	26.040000	26.050000	25.980000
2022-12-01	13:00:00	BMFBOVESPA:PETR4	26.020000	26.080000	25.980000
2022-12-01	13:05:00	BMFBOVESPA:PETR4	26.060000	26.060000	25.990000
close volume rm rolling_mean					
datetime					
2022-09-12	12:00:00	27.907147	981930.0	NaN	NaN
2022-09-12	12:05:00	27.942338	1205048.0	NaN	NaN
2022-09-12	12:10:00	28.021520	834736.0	NaN	NaN
2022-09-12	12:15:00	27.995126	405659.0	NaN	NaN
2022-09-12	12:20:00	27.995126	282790.0	NaN	NaN
...		...	...	...	...
2022-12-01	12:45:00	26.080000	481800.0	26.205	26.317667
2022-12-01	12:50:00	26.040000	692700.0	26.177	26.308333
2022-12-01	12:55:00	26.020000	363100.0	26.145	26.298000
2022-12-01	13:00:00	26.050000	449300.0	26.119	26.284000
2022-12-01	13:05:00	26.020000	225000.0	26.089	26.266333

```
[5000 rows x 8 columns]
```