



Investing: Technical Analysis in Python

Ruslan Korniichuk | 31.08.2025

ver. 1.0.1

Technical Analysis
Search term

Technical analysis
Topic

+ Add comparison

United States

Past 5 years

All categories

Web Search

Note: This comparison contains both Search terms and Topics, which are measured differently.

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Interest over time ?

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Prawo.pl > Podatki > MF: Inwestycje do 100 tys. zł bez podatku Belki

MF: Inwestycje do 100 tys. zł bez podatku Belki

mp/PAP | PIT DOMOWE FINANSE AKTUALNOŚCI
Data dodania: 05.08.2025



Ministerstwo Finansów proponuje wprowadzenie Osobistego Konta Inwestycyjnego (OKI). Dzięki niemu będzie można inwestować do 100 tys. zł bez podatku od zysków kapitałowych. Natomiast inwestycje powyżej 100 tys. zł będą opodatkowane w wysokości 0,8–0,9 proc. wartości inwestycji.

Źródło: iStock

PODATKI – OSTATNIO DODANE

- 30.08 2025 Jak rozliczyć najem krótkoterminowy
- 29.08 2025 Projekt budżetu na 2026 r. przekazany Radzie Dialogu Społecznego
- 29.08 2025 Zwolnienie z podatku od darowizn będzie możliwe także po 6 miesiącach
- 29.08 2025 WSA: Honorarium z praw autorskich trzeba liczyć osobno
- 29.08 2025 Wdrożenie KSeF: Czas na zmiany umów z kontrahentami i porządki w firmach
- 28.08 2025 KE proponuje zniesienie cel na towary przemysłowe z USA



Watchlist

INDICES

SPX

5308.14

61.45

1.17%

NDQ

18596.64

273.87

1.49%

DJI

39908.01

349.89

0.88%

VIX

12.45

-0.97

-7.23%

DX

104.306

-0.715

-0.68%

STOCKS

AAPL

189.72

2.29

1.22%

TSLA

173.99

-3.56

-2.01%

NFLX

613.52

-0.14

-0.02%

FUTURES

USOIL

78.80

0.44

0.56%

GOLD

2385.70

27.90

1.18%

SILVER

29.66

1.050

3.67%

PKO

PKOBP · GPW

Finance · Major Banks

57.60

0.10

57.70

MARKET CLOSED (MAY 15 19:12 UTC+2)

yesterday · PKO BP Recommends FY 2023 Dividend Of 2.59 Zlotys/Shr

Key stats

Next earnings report

In 99 days

Volume

3.44M

Average Volume (30D)

2.81M

Market capitalization

72.10B

Earnings

99

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Data may differ

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Learning materials

01

Disclaimer

NO investment advice

The content is for **informational purposes only**. You should NOT interpret any such information or other material as investment, financial, legal, tax, or other advice.

02

Technical Analysis

Technical Analysis (TA)

TA is a **trading discipline** used to identify trading opportunities in price trends and patterns seen on charts.

A method of analyzing and **predicting stock movements** based on past market data, primarily price and volume [src].

Technical Analysis vs Fundamental Analysis

Technical Analysis

pros

- timely
- simplicity
- risk management (e.g., stop-loss)
- psychological insights
- disciplined trading (less emotion)
- adaptable

Fundamental Analysis

pros

- in-depth understanding
- long-term focus
- risk mitigation
- qualitative factors
- adaptable

Technical Analysis vs Fundamental Analysis

Technical Analysis

cons

- self-fulfilling
- noise (false signals)
- lack of fundamentals
- subjectivity
- information overload

Fundamental Analysis

cons

- time-consuming
- short-term inefficiency
- market irrationality
- subjectivity
- information overload

03

Data

Data

- yfinance Python lib
- EODHD Financial Data APIs
- Stooq Historical data (.CSV, scraping), e.g.:
 - stooq.com/q/d/?s=pko
 - stooq.com/q/d/?s=pzu
- GPW Price archive (.XLS, scraping)

ValueRaider Merge pull request #2585 from roberttidball/patch-1

8b71e6c · last week

1,606 Commits

.github	Bug form: emphasise not affiliated with Yahoo, add reporti...	2 months ago
doc	Update index.rst	last week
tests	Fix a test	last month
yfinance	Version 0.2.65	last month
.gitignore	Add price repair to doc	2 months ago
.travis.yml	removed python 3.5 support	4 years ago
CHANGELOG.rst	Version 0.2.65	last month
CODE_OF_CONDUCT.md	Create CODE_OF_CONDUCT.md	2 years ago
CONTRIBUTING.md	Tidy CONTRIBUTING.md	3 months ago
LICENSE.txt	new license	6 years ago
MANIFEST.in	first commit	8 years ago

About

Download market data from Yahoo! Finance's API

[ranaroussi.github.io/yfinance](https://github.com/ranaroussi/yfinance)

python pandas yahoo-finance-api
market-data stock-data financial-data
yahoo-finance fix-yahoo-finance

- Readme
- Apache-2.0 license
- Code of conduct
- Contributing
- Activity
- 18.9k stars
- 261 watching
- 2.8k forks
- Report repository



Do you need
access to more data?

See our plans

EODHD API Marketplace



UNICORN
Data Services

US Stock Options Data API

\$ **29.99** /mo.

\$99.99 for the first 3 months

The US Stock Market Options Data API offers daily updated options data for 6 000 top-traded US stocks, including bid/ask prices, Greeks, implied volatility, and contract details. Available in...

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Financial APIs Categories

Stock Market Prices, Splits and Dividends Data API

Fundamental and Economic Financial Data API

Exchanges (Stock Market) Financial APIs

Alternative Data Financial API

Available Data Feeds

CLI (Curl), Python, PHP/Laravel,

Search

🏠 / Documentation / Most Popular Financial APIs / QUICK START with our Financial Data APIs

QUICK START with our Financial Data APIs

Welcome to EODHD! We specialize in providing extensive financial data through APIs. With our services, you can seamlessly integrate a wide range of financial data into your projects, including 30+ years **Historical End-of-Day (EOD) prices**, **Real-time prices**, **Intraday data**, **Fundamental data** for **stocks**, **ETFs**, **funds**, **indices**, **bonds**, **forex pairs**, and **alternative currencies**, across various programming languages or without coding at all (check Excel and Google Sheets add-ons below).

Our API is designed to be user-friendly, and to further simplify the development process, we offer libraries for the most popular programming languages, including PHP, C#, and R, among others. You can find these libraries [here](#) and also follow us on [GitHub](#) for updates.

Let's start a quick tour through our most popular API endpoints and useful widgets. All examples we provide are in JSON format, and we highly **recommend installing** the [JSON Viewer Plugin](#) for Chrome before testing API requests in your browser. It will ensure that all returned data appears well-structured and easier to read.

API Key (token)

An API key or token looks like **15d35814de0491.03453438** (each API key is different) and is necessary to make any API requests for our data. The key will be generated automatically after registration and can be found in the user dashboard or in the email sent right after signing up.

All API requests include this token as a parameter. This is how our server determines which data is available to which user, as we offer different plans and have an **API call quota** for each user. Refer to the API request examples further in this article – all of them use the “demo” API key or your API key if you are already a registered user and logged in.

Important! Do not share this API key publicly, as other users might use your plan quota.

It is possible to re-generate API key on [user dashboard page](#).

Demo mode

Without registration (or without API key) you can test a few stock & forex tickers for getting almost all types of data we offer – Fundamental Data, EOD Historical Data, Live Data, Real-time, Financial News API

Symbol np: ^SPX

Kwotuj

Login i hasło

zapisz ☒

Loguj

Historical data: Powszechna Kasa Oszczędności Bank Polski SA (PKO)

3 Apr, 17:04 **71.92** -3.66 (-4.84%)[PZU](#) -2.52%

More On PKO

[Summary](#)[Chart](#)[Chart HTML5](#)[Technical Analysis](#)► **Historical data**[News](#)[Calendar](#)[Profile](#)[Shareholders](#)[Operations](#)[Ulubione](#)[GPW, WIG20, Akcje](#)[Indeksy, Azja, Europa, Ameryka, Futures](#)[Towary, Obligacje](#)[Waluty, €, \\$, ¥, zł](#)[Statystyka sesji](#)[Market On-line](#)

Start date:

eg. Jan 15 2008

Apr ▼ 1 2025

End date:

Apr ▼ 4 2025

[Default date range](#)

Interval:

☒ Daily☐ Weekly☐ Monthly☐ Quarterly☐ Yearly

Skip:

☐ splits☒ dividends☐ preemptive rights☐ prepurchase rights☐ preaccession rights☐ denominations☐ others

Easier access to the data PKO

On the ticker field set "**d:pk0**",
and Stooq instantly take you to
the site with historical data.

English
[polski](#)

Historical values of PKO

No.	Date	Open	High	Low	Close	Change		Volume
3	3 Apr 2025	74.4	74.8	71.5	71.92	-4.84%	-3.66	3,100,454
2	2 Apr 2025	75.5	76.16	74.22	75.58	-0.18%	-0.14	1,834,015
1	1 Apr 2025	75.4	76.72	75.3	75.72			2,510,329

<< | < | > | >>

<< | < | > | >>

[▼ Download data in csv file...](#)Downloaded data separator: **comma** | [semicolon](#)

Archived prices

Use GPW historical data. Note that you also can browse through historical data in individual instrument sheets.

Select the category of instrument

Equities



Select the instrument (optional)

-- select --



Select the date

03-04-2025



Show results



Download (XLS)

Full version of the table

Name ---	Currency ---	Opening price ---	Maximum price ---	Minimum price ---	Closing price ---	% price change ---	Turnover value (thou.) ---
06MAGNA	PLN	2.7600	2.8400	2.7300	2.7500	-2.48	58.61
08OCTAVA	PLN	0.8850	0.8850	0.8850	0.8850	0.00	0.00
11BIT	PLN	198.5000	202.8000	181.4000	184.7000	-9.46	10,951.21
3RGAMES	PLN	0.6360	0.6560	0.6080	0.6200	-2.21	241.40
4MASS	PLN	6.3000	6.3900	6.1300	6.1900	-2.52	243.71

04

Data may differ

Archived prices

Use GPW historical data. Note that you also can browse through historical data in individual instrument sheets.

Select the category of instrument

Equities



Select the instrument (optional)

PKOBP



Select the date

15-05-2023



Show results



Download (XLS)

Full version of the table

Name ***	Trading session date ▼	Currency ***	Opening price ***	Maximum price ***	Minimum price ***	Closing price ***	% price change ***	Turnover value (thou.) ***
PKOBP	15-05-2023	PLN	31.6300	31.6700	31.0600	31.3700	0.06	46,996.85

Historical data: Powszechna Kasa Oszczędności Bank Polski SA (PKO)

3 Apr, 17:0471.92-3.66(-4.84%)

[PZU](#) -2.52%

More On PKO

[Summary](#)
[Chart](#)
[Chart HTML5](#)
[Technical Analysis](#)
► **Historical data**
[News](#)
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[Operations](#)

Ulubione

Start date:
eg. Jan 15 2008

May

15

2023

End date:

May

15

2023

[Default date range](#)

Show

Interval:

☒ Daily
☐ Weekly
☐ Monthly
☐ Quarterly
☐ Yearly

Skip:

☐ splits
☐ dividends
☐ preemptive rights
☐ prepurchase rights
☐ preaccession rights
☐ denominations
☐ others

Historical values of PKO

<< | < | > | >>

No.	Date	Open	High	Low	Close	Change	Volume
1	15 May 2023	29.305	29.342	28.7769	29.0641		1,618,956

Easier access to the data PKO

On the ticker field set "d:pk0", and Stooq instantly take you to the site with historical data.

English
[polski](#)

Name ***	Trading session date ▼	Currency ***	Opening price ***	Maximum price ***	Minimum price ***	Closing price ***	% price change ***	Turnover value (thou.) ***
PKOBP	15-05-2023	PLN	31.6300	31.6700	31.0600	31.3700	0.06	46,996.85

Historical data: Powszechna Kasa Oszczędności Bank Polski SA (PKO)

3 Apr, 17:0471.92-3.66(-4.84%)

[PZU](#) -2.52%

More On PKO

[Summary](#)
[Chart](#)
[Chart HTML5](#)
[Technical Analysis](#)

► Historical data

[News](#)
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Ulubione

Start date:
eg. Jan 15 2008

May

15

2023

End date:

May

15

2023

[Default date range](#)

Show

Interval:

☒ Daily

☐ Weekly

☐ Monthly

☐ Quarterly

☐ Yearly

Skip:

☐ splits

☒ dividends

☐ preemptive rights

☐ prepurchase rights

☐ preaccession rights

☐ denominations

☐ others

Easier access to the data PKO

On the ticker field set "d:pk0", and Stooq instantly take you to the site with historical data.

English
[polski](#)

Historical values of PKO

<< | < | > | >>

No.	Date	Open	High	Low	Close	Change	Volume
1	15 May 2023	31.630050113518	31.669985682677	31.060050814253	31.370037178103		1,499,950

Name ***	Trading session date ▼	Currency ***	Opening price ***	Maximum price ***	Minimum price ***	Closing price ***	% price change ***	Turnover value (thou.) ***
PKOBP	15-05-2023	PLN	31.6300	31.6700	31.0600	31.3700	0.06	46,996.85

05

Python libraries

TA-Lib (aka talib)

ta-lib-python Public[Watch](#) **335**[Fork](#) **1.9k**[Starred](#) **11.1k**[master](#)[4 Branches](#) [48 Tags](#)[Go to file](#)[Add file](#)[Code](#)

About

Python wrapper for TA-Lib (<http://ta-lib.org/>).

ta-lib.github.io/ta-lib-python

[python](#) [finance](#) [pattern-recognition](#)
[quantitative-finance](#) [technical-analysis](#)
[ta-lib](#)

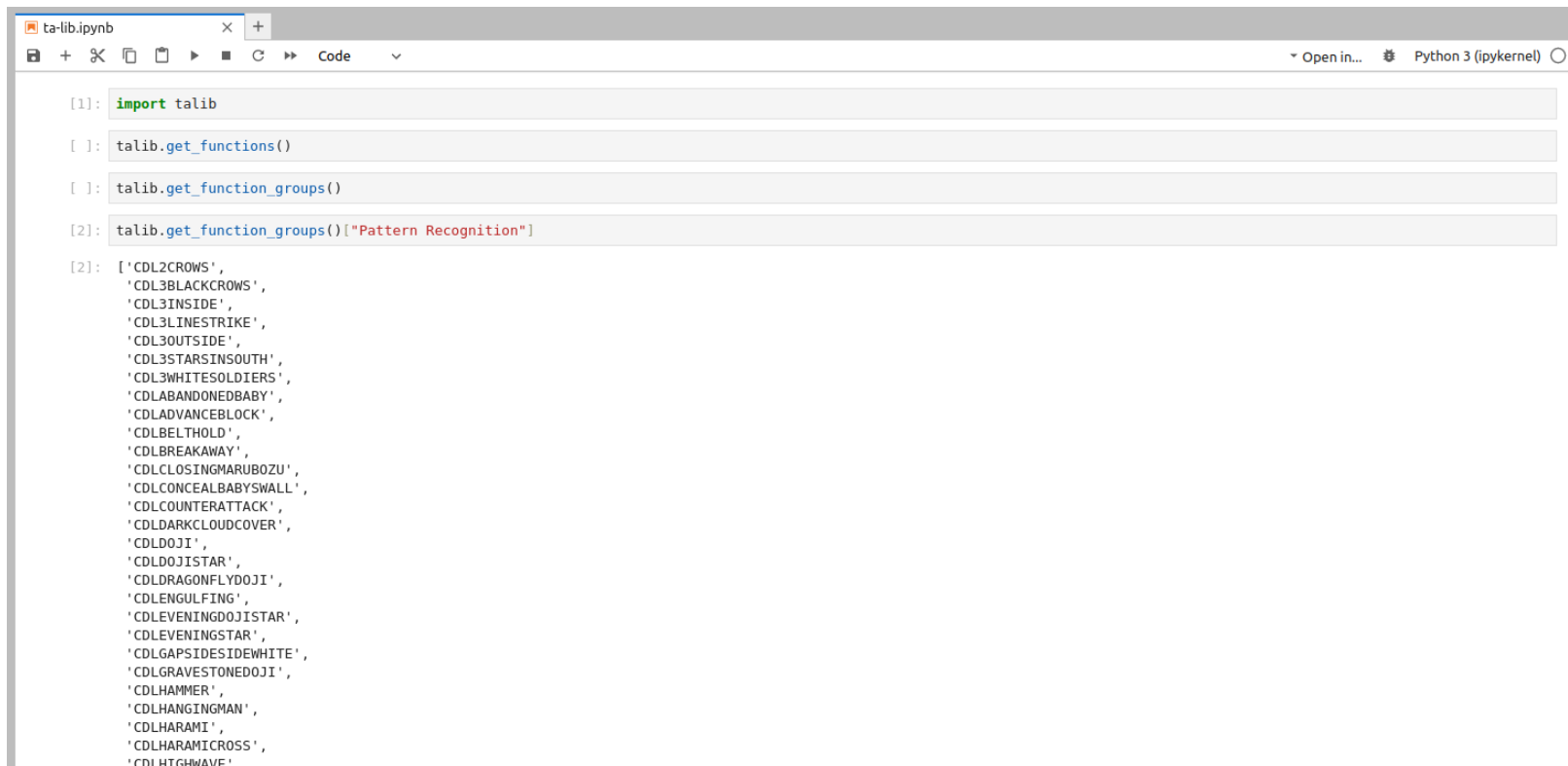
[Readme](#)[BSD-2-Clause license](#)[Cite this repository](#)[Activity](#)[Custom properties](#)[11.1k stars](#)[335 watching](#)[1.9k forks](#)[Report repository](#)

mrjbq7 remove old python2 things ✓

f5e1756 · 3 days ago [809 Commits](#)

	.github/workflows	Revert ".github/workflows:"	3 weeks ago
	docs	remove old python2 things	3 days ago
	talib	bump cython 3.1.3	5 days ago
	tests	remove old python2 things	3 days ago
	tools	remove old python2 things	3 days ago
	.gitignore	tools: Update scripts for generating code	9 years ago
	AUTHORS	add AUTHORS file	13 years ago
	CHANGELOG	bump cython 3.1.3	5 days ago
	CITATION.cff	update citation file for 0.6.5 release	3 weeks ago
	COPYRIGHT	update changelog and dev docs.	12 years ago
	DEVELOPMENT	DEVELOPMENT	3 weeks ago

TA-Lib: Supported indicators



The screenshot shows a Jupyter Notebook interface with a single cell containing the following code:

```
[1]: import talib

[ ]: talib.get_functions()

[ ]: talib.get_function_groups()

[2]: talib.get_function_groups()["Pattern Recognition"]
```

The output of the last cell is a list of 35 candlestick pattern indicators:

```
[2]: ['CDL2CROWS',
      'CDL3BLACKCROWS',
      'CDL3INSIDE',
      'CDL3LINESTRIKE',
      'CDL3OUTSIDE',
      'CDL3STARSINSOUTH',
      'CDL3WHITESOLDIERS',
      'CDLABANDONEDBABY',
      'CDLADVANCEBLOCK',
      'CDLBELTHOLD',
      'CDLBREAKAWAY',
      'CDLCLOSINGMARUBOZU',
      'CDLCONCEALBABYSWALL',
      'CDLCOUNTERATTACK',
      'CDLDARKCLOUDCOVER',
      'CDLDOJI',
      'CDLDOJISTAR',
      'CDLDragonFLYDOJI',
      'CDLENGULFING',
      'CDLEVENINGDOJISTAR',
      'CDLEVENINGSTAR',
      'CDLGAPSIDESIDEWHITE',
      'CDLGRAVESTONEDOJI',
      'CDLHAMMER',
      'CDLHANGINGMAN',
      'CDLHARAMI',
      'CDLHARAMICROSS',
      'CDLHIGHWAVE']
```

Aroon Oscillator (AROONOSC)

The **Aroon Oscillator** is a trend-following indicator that uses aspects of the Aroon Indicator (Aroon Up and Aroon Down) to gauge the strength of a current trend and the likelihood that it will continue.

The oscillator moves between -100 and 100. A high oscillator value is an indication of an uptrend while a low oscillator value is an indication of a downtrend [[src](#)].



TA-Lib: Momentum Indicators

```
ta-lib.ipynb
+
Python 3 (ipykernel)

[1]: import pandas as pd
import talib
import yfinance as yf

[2]: pd.options.plotting.backend = "plotly"

[3]: df = yf.download("AAPL", start="2024-03-01", end="2024-05-15")

[*****100%*****] 1 of 1 completed

[4]: df["aroon"] = talib.AROONOSC(df.High, df.Low)

[5]: df.aroon.tail(20)

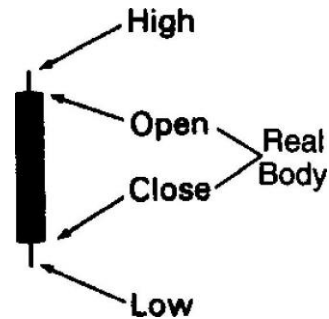
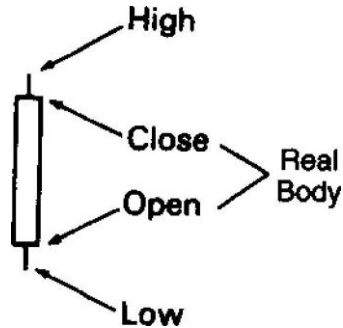
[5]: Date
2024-04-17    14.285714
2024-04-18   -28.571429
2024-04-19   -35.714286
2024-04-22   -35.714286
2024-04-23   -35.714286
2024-04-24   -35.714286
2024-04-25   -35.714286
2024-04-26   -35.714286
2024-04-29   -35.714286
2024-04-30   -35.714286
2024-05-01   -35.714286
2024-05-02   -35.714286
2024-05-03    71.428571
2024-05-06    71.428571
2024-05-07    71.428571
2024-05-08    71.428571
2024-05-09    71.428571
2024-05-10    64.285714
2024-05-13   100.000000
2024-05-14   100.000000
Name: aroon, dtype: float64
```



Candle

The rectangular sections of the candle lines are called the **real body**, and represents the range between the session's open and close.

The thin lines above and below the real body are the **shadows**, and represent the session's price extremes [src].



Hammer Candlestick

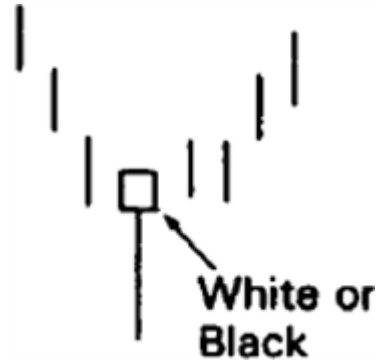
The **hammer** can be recognized by three criteria:

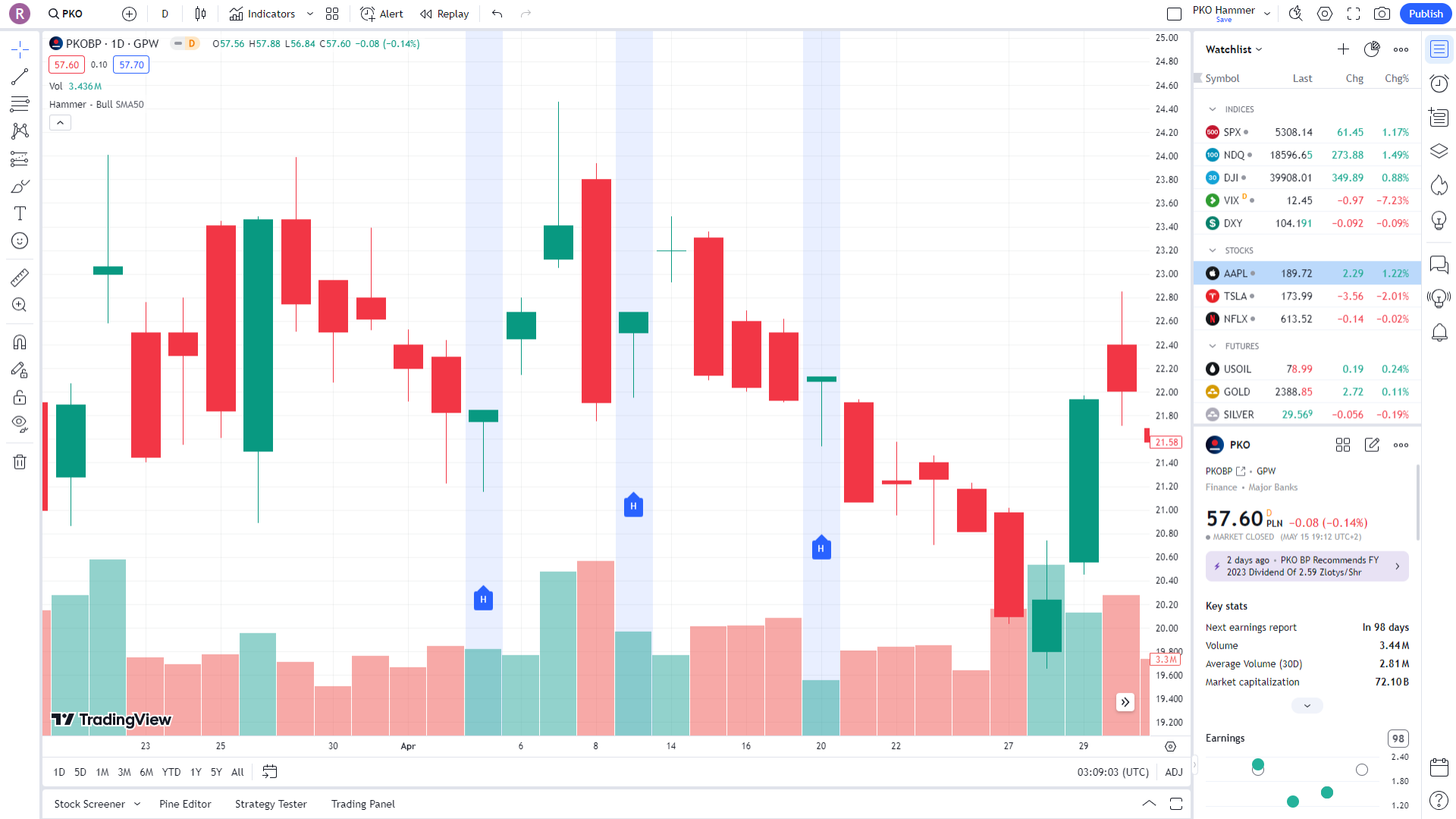
1. The real body is at the upper end of the trading range. The color of the real body is not important.
2. It has a long lower shadow that should be at least twice the height of the real body.
3. It should have no, or a very short, upper shadow [[src](#)].



Hammer Candlestick

Trend: A hammer must come after a decline [[src](#)].





TA-Lib: Abstract API



```
[1]: API_TOKEN = "REDACTED"

[2]: import pandas as pd
import requests
from talib import abstract

[3]: url = f'https://eodhd.com/api/eod/PKO.WAR?api_token={API_TOKEN}&fmt=json'
data = requests.get(url).json()

[4]: df = pd.json_normalize(data)
df.columns

[4]: Index(['date', 'open', 'high', 'low', 'close', 'adjusted_close', 'volume'], dtype='object')

[5]: df = df.drop('close', axis=1)
df = df.rename(columns={"adjusted_close": "close"})

[6]: df["hammer"] = abstract.CDLHAMMER(df)

[7]: df.hammer

0      0
1      0
2      0
3      0
4      0
..
247    0
248    0
249    0
250    0
251    0
Name: hammer, Length: 252, dtype: int32
```

Pandas TA

A slide with no useful information at all

- Just filling in the gap between the last slide and the next one (which will be along in just a moment)
- No need to write this down, unless you feel compelled to do so
- Nothing on this slide is examinable
- In fact, I am not really sure why I bothered with it

A slide with no useful information at all

- Just filling in the gap between the last slide and the next one (which will be along in just a moment)
- No need to write this down, unless you feel compelled to do so
- Nothing on this slide is examinable
- In fact, I am not really sure why I bothered with it



pandas-ta Public

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main 3 Branches 6 Tags

Go to file Add file Code

twopirllc	Update setup.py	b465491 · 10 months ago	586 Commits
.github/ISSUE_TEMPLATE	Update bug report	3 years ago	
data	ENH strategy method params and col_numbers kwargs MAL...	5 years ago	
docs	formatting fixes, PEP8 etc	5 years ago	
examples	Removed the need to call bind explicitly	4 years ago	
images	ENH logo MAINT gitignore + update example notebooks	4 years ago	
pandas_ta	MAINT custom minor refactoring	4 years ago	
tests	ENH #342 jma indicator MAINT jma ext TST DOC	4 years ago	
.gitignore	MAINT hwc colum renaming and reqs update	4 years ago	
CODE_OF_CONDUCT.md	Create CODE_OF_CONDUCT.md	5 years ago	
LICENSE	LICENSE update	4 years ago	
Makefile	ENH BUG #38 vwap anchor argument fix	5 years ago	
README.md	DOC pypi version bump	4 years ago	
__init__.py	Add 2 TI : Heikin-Ashi and supertrend	5 years ago	
_config.yml	Set theme jekyll-theme-slate	6 years ago	
requirements.txt	Bump numpy from 1.19.5 to 1.22.0	3 years ago	
setup.py	Update setup.py	10 months ago	

README Code of conduct MIT license

About

Technical Analysis Indicators - Pandas TA is an easy to use Python 3 Pandas Extension with 150+ Indicators

twopirllc.github.io/pandas-ta/

- finance technical trading
- jupyter-notebook pandas python3
- stock-market trading-algorithms
- technical-analysis dataframe
- technical-indicators fundamental-analysis
- technical-analysis-library
- technical-analysis-indicators
- pandas-dataframe-extension
- pandas-extension pandas-ta

- Readme
- MIT license
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- 6k stars
- 113 watching
- 1.2k forks
- Report repository

Releases 5

PandasTA-v0.3.14b Latest on Jul 28, 2021

+ 4 releases

Packages



twopirllc / twopirllc

🔍 Type to search



<> Code • Issues 1 🔗 Pull requests 🎬 Actions 📁 Projects 🛡 Security 📊 Insights



twopirllc

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★ Star 4

🔗 master

🔗 1 Branch 🏷 0 Tags

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<> Code



twopirllc Update README.md

60a37ca · 4 months ago

🕒 5 Commits

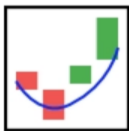


README.md

Update README.md

4 months ago

📖 README



Pandas TA

News

[Pandas TA](#) has moved!

The current version is [0.4.25b](#) with a *pip* release available after July 1st, 2025. Future releases after July 1st, 2025 will be subject to paid releases for businesses and organizations and subscription-based options for others.

About

Kevin Johnson

📖 Readme

🔔 Activity

☆ 4 stars

👁 2 watching

🍴 3 forks

Report repository

Releases

No releases published

Packages

No packages published



A popular and comprehensive Technical Analysis Library in Python 3 that leverages *numba* and *numpy* for accuracy and performance, and *pandas* for simplicity and bulk processing. The library contains more than 150 indicators and utilities as well as 60 Candlestick Patterns when **TA Lib** is installed.



Pandas TA: Supported indicators

```
pandas_ta.ipynb x +
+ ⌂ 📄 ▶ ■ ↻ ⏪ Code ⌵
~ Open in... 🛡 Python 3 (ipykernel) ○
```

```
[1]: import pandas as pd
import pandas_ta as ta

[2]: df = pd.DataFrame()

[3]: # List of all indicators
df.ta.indicators()

Pandas TA - Technical Analysis Indicators - v0.3.14b0
Total Indicators & Utilities: 205
Abbreviations:
    aberration, above, above_value, accbands, ad, adosc, adx, alma, amat, ao, aobv, apo, aroon, atr, bbands, below, below_value, bias, bop, brar, cci, cdl_pattern, cdl_z,
    cfo, cg, chop, cksp, cmf, cmo, coppock, cross, cross_value, cti, decay, decreasing, dema, dm, donchian, dpo, ebsw, efi, ema, entropy, eom, er, eri, fisher, fwma, ha, hilo,
    hl2, hlc3, hma, hwc, hwma, ichimoku, increasing, inertia, jma, kama, kc, kdj, kst, kurtosis, kvo, linreg, log_return, long_run, macd, mad, massi, mcgd, median, mfi, midpoi
    nt, midprice, mom, natr, nvi, obv, ohlc4, pdist, percent_return, pgo, ppo, psar, psl, pvi, pvo, pvol, pvr, pvt, pwma, qqe, qstick, quantile, rma, roc, rsi, rsx, rvgi, rvi,
    short_run, sinwma, skew, slope, sma, smi, squeeze, squeeze_pro, ssf, stc, stdev, stoch, stochrsi, supertrend, swma, t3, td_seq, tema, thermo, tos_stdevall, trima, trix, tr
    ue_range, tsi, tsignals, ttm_trend, ui, uo, variance, vhf, vidya, vortex, vp, vwap, vwma, wcp, willr, wma, xsignals, zlma, zscore

Candle Patterns:
    2crows, 3blackcrows, 3inside, 3linestrike, 3outside, 3starsinsouth, 3whitesoldiers, abandonedbaby, advanceblock, belthold, breakaway, closingmarubozu, concealbabyswal
    l, counterattack, darkcloudcover, doji, dojistar, dragonflydoji, engulfing, eveningdojistar, eveningstar, gapsidesidewhite, gravestonedoji, hammer, hangingman, harami, har
    amicross, highwave, hikkake, hikkakemod, homingpigeon, identical3crows, inneck, inside, invertedhammer, kicking, kickingbylength, ladderbottom, longleggeddoji, longline, m
    arubozu, matchinglow, mathold, morningdojistar, morningstar, onneck, piercing, rickshawman, riseall3methods, separatinglines, shootingstar, shortline, spinningtop, stalle
    dpattern, sticksandwich, takuri, tasukigap, thrusting, tristar, unique3river, upsidegap2crows, xsidegap3methods
```

Average Directional Index (ADX)

The **Average Directional Index (ADX)** is a technical analysis indicator used by some traders to determine the strength of a trend.

The trend can be either up or down, and this is shown by two accompanying indicators, the negative directional indicator (-DI) and the positive directional indicator (+DI) [[src](#)] .

Average Directional Index (ADX)

ADX value	trend strength
0-25	Absent or weak trend
25-50	Strong trend
50-75	Very strong trend
75-100	Extremely strong trend



Pandas TA: Trend

```
pandas_ta.ipynb
```

```
[1]: import pandas as pd
import pandas_ta as ta

[2]: df = pd.DataFrame()
df = df.ta.ticker("aapl") # we have yfinance installed
df.columns

[2]: Index(['Open', 'High', 'Low', 'Close', 'Volume', 'Dividends', 'Stock Splits'], dtype='object')

[3]: adx = ta.adx(df.High, df.Low, df.Close)

[4]: df = pd.concat([df, adx], axis=1)

[5]: df.tail(5)
```

	Open	High	Low	Close	Volume	Dividends	Stock Splits	ADX_14	DMP_14	DMN_14
2024-05-09 00:00:00-04:00	182.312720	184.409882	181.863333	184.320007	48983000	0.00	0.0	20.670403	39.746141	17.180721
2024-05-10 00:00:00-04:00	184.899994	185.089996	182.130005	183.050003	50759500	0.25	0.0	22.125505	38.812820	16.224498
2024-05-13 00:00:00-04:00	185.440002	187.100006	184.619995	186.279999	72044800	0.00	0.0	23.766662	39.632688	14.994774
2024-05-14 00:00:00-04:00	187.509995	188.300003	186.289993	187.429993	52393600	0.00	0.0	25.456839	40.406186	14.408194
2024-05-15 00:00:00-04:00	187.910004	190.649994	187.369995	189.720001	70356000	0.00	0.0	27.334479	42.406357	13.485692

Pandas TA: DataFrame Extension

```
pandas_ta.ipynb
```

```
[1]: import pandas as pd
import pandas_ta as ta

[2]: df = pd.DataFrame()
df = df.ta.ticker("aapl") # we have yfinance installed
df.columns

[2]: Index(['Open', 'High', 'Low', 'Close', 'Volume', 'Dividends', 'Stock Splits'], dtype='object')

[3]: adx = df.ta.adx() # no docstring

[4]: df = pd.concat([df, adx], axis=1)

[5]: df.tail(5)
```

	Open	High	Low	Close	Volume	Dividends	Stock Splits	ADX_14	DMP_14	DMN_14
2024-05-09 00:00:00-04:00	182.312720	184.409882	181.863333	184.320007	48983000	0.00	0.0	20.670404	39.746141	17.180721
2024-05-10 00:00:00-04:00	184.899994	185.089996	182.130005	183.050003	50759500	0.25	0.0	22.125506	38.812820	16.224497
2024-05-13 00:00:00-04:00	185.440002	187.100006	184.619995	186.279999	72044800	0.00	0.0	23.766663	39.632687	14.994774
2024-05-14 00:00:00-04:00	187.509995	188.300003	186.289993	187.429993	52393600	0.00	0.0	25.456840	40.406186	14.408193
2024-05-15 00:00:00-04:00	187.910004	190.649994	187.369995	189.720001	70356000	0.00	0.0	27.334479	42.406357	13.485692

Engulfing Pattern

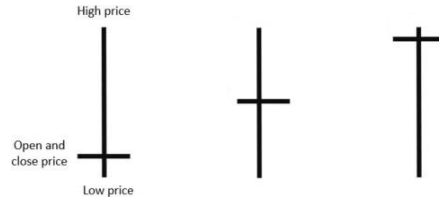
There are three criteria for an engulfing pattern:

1. The market has to be in a clearly **definable trend**.
2. Two candles comprise the engulfing pattern. The **second real body must engulf** the first real body.
3. The second real body of the engulfing pattern should be the **opposite color** of the first real body (exception to this rule is if the first real body is a doji) [[src](#)].

Engulfing Pattern

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Engulfing Pattern

The market has to be in a clearly definable **uptrend** (for a **bearish** engulfing pattern) or **downtrend** (for a **bullish** engulfing pattern), even if the trend is short term [[src](#)].





Pandas TA: Candle Patterns

```
pandas_ta.ipynb
```

```
[1]: import pandas as pd
import pandas_ta as ta

[2]: df = pd.read_csv("pko_d.csv") # https://stoq.com/q/d/l/?s=pko&i=d&o=0100000

[3]: df.columns

[3]: Index(['Date', 'Open', 'High', 'Low', 'Close', 'Volume'], dtype='object')

[4]: df["engulfing"] = df.ta.cdl_pattern(name="engulfing")

[5]: df[df.engulfing != 0]
```

	Date	Open	High	Low	Close	Volume	engulfing
6	2004-11-19	14.1082	14.1082	13.9376	13.9376	5.269801e+06	-100.0
49	2005-01-19	14.9671	15.4858	14.7975	15.4858	4.422310e+06	100.0
52	2005-01-24	14.9108	15.2010	14.9108	15.2010	1.448239e+06	100.0
77	2005-02-28	16.3456	16.4580	15.8268	16.0598	1.889497e+06	-100.0
124	2005-05-10	15.1439	15.1439	14.6841	14.7975	1.271948e+06	-100.0
...	...	...	...	...	...	...	...
4772	2023-12-01	46.1675	48.5154	46.1675	48.2718	3.108177e+06	100.0
4783	2023-12-18	47.6873	49.1583	47.5119	49.0999	2.286195e+06	100.0
4833	2024-02-29	54.4200	56.1000	54.4200	55.5600	4.304469e+06	100.0
4851	2024-03-26	57.0800	58.4000	56.6200	58.2000	2.748627e+06	100.0
4859	2024-04-09	61.0600	61.1200	59.0200	59.2000	2.698271e+06	-100.0

342 rows x 7 columns

Technical Analysis (aka bukosabino/ta)

ta

Public

Sponsor

Watch 150

Fork 1.1k

Starred 4.6k

master

18 Branches

65 Tags

Go to file

Add file

Code

bukosabino	Merge pull request #330 from bukosabino/develop-linter-vpt	5654782 · 2 years ago	662 Commits
.circleci	fix circle ci config	2 years ago	
.github	Update FUNDING.yml	5 years ago	
docs	Create index.rst	4 years ago	
examples_to_use	update example notebooks/scripts	5 years ago	
static	refactor doc folder	5 years ago	
ta	fixing linter details	2 years ago	
test	fixing linter details	2 years ago	
.coveragerc	cleaning test folder structure	5 years ago	
.coveralls.yml	coverage	6 years ago	
.gitignore	clean code	6 years ago	
.prospector.yml	cleaning code (prospector, black)	5 years ago	
LICENSE	Update LICENSE	5 years ago	
MANIFEST	update version	6 years ago	
Makefile	Fixing linter	2 years ago	
README.md	Improve README	2 years ago	
RELEASE.md	update release and setup.py	2 years ago	
pylintrc	cleaning code (prospector, black)	5 years ago	
requirements-core.txt	Bumping numpy because of vulnerability issue	4 years ago	
requirements-coverage.txt	refactor names requirements files	6 years ago	

About

Technical Analysis Library using Pandas and Numpy

technical-analysis-library-in-python.read...

python

trading

numpy

financial

pandas

python3

volume

momentum

technical-analysis

oscillator

trend

volatility

fundamental-analysis

trend-analysis

technical-analysis-library

series-datasets

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Releases

65 tags

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tidelift.com/funding/github/pypi/ta

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Packages

No packages published

Technical Analysis: Trend

```
ta.ipynb
[1]: import ta
import yfinance as yf

[2]: df = yf.download("AAPL", start="2024-03-01", end="2024-05-15")
df.columns

[*****100%*****] 1 of 1 completed

[2]: Index(['Open', 'High', 'Low', 'Close', 'Adj Close', 'Volume'], dtype='object')

[3]: df["adx"] = ta.trend.adx(df.High, df.Low, df["Adj Close"])
df["adx_pos"] = ta.trend.adx_pos(df.High, df.Low, df["Adj Close"])
df["adx_neg"] = ta.trend.adx_neg(df.High, df.Low, df["Adj Close"])

# df["adx"] = ta.trend.ADXIndicator(df.High, df.Low, df["Adj Close"]).adx()
# df["adx_pos"] = ta.trend.ADXIndicator(df.High, df.Low, df["Adj Close"]).adx_pos()
# df["adx_neg"] = ta.trend.ADXIndicator(df.High, df.Low, df["Adj Close"]).adx_neg()

[4]: df.tail(5)

[4]:
```

	Open	High	Low	Close	Adj Close	Volume	adx	adx_pos	adx_neg
Date									
2024-05-08	182.850006	183.070007	181.449997	182.740005	182.492477	45057100	17.932975	38.336015	18.097967
2024-05-09	182.559998	184.660004	182.110001	184.570007	184.320007	48983000	19.448107	39.454201	17.255349
2024-05-10	184.899994	185.089996	182.130005	183.050003	183.050003	50759500	20.918870	38.083183	16.306297
2024-05-13	185.440002	187.100006	184.619995	186.279999	186.279999	72044800	22.579496	38.948807	15.083854
2024-05-14	187.509995	188.300003	186.289993	187.429993	187.429993	52393600	24.290578	39.740667	14.499976

Comparison

TA-Lib (talib)

pros

- 11.1K stars
- 34 contributors
- 501 closed issues
- actively developing
- supports Polars
- speed

Pandas TA as of 04.04.2025

pros

- ~~○ 6K stars~~
- ~~○ 39 contributors~~
- ~~○ 610 closed issues~~
- supports strategies

cons

- paid
- no docstring for `df.ta`
- ~~○ not actively developing~~

Technical Analysis

pros

- 4.8K stars
- 31 contributors
- 104 closed issues

cons

- no candlestick
- not actively developing

06

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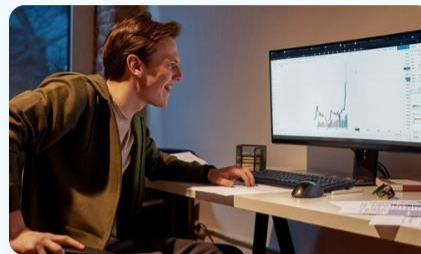


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Skills

Online

 Ended process

What you need to know



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Open to everyone

Summary

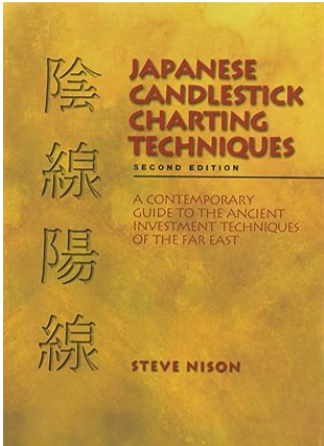
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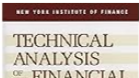
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