



Investing: Technical Analysis libraries in Python

Ruslan Kornichuk | 24.04.2025

ver. 1.0.0

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.

[LEARN MORE](#)

Interest over time

Download Expand Share

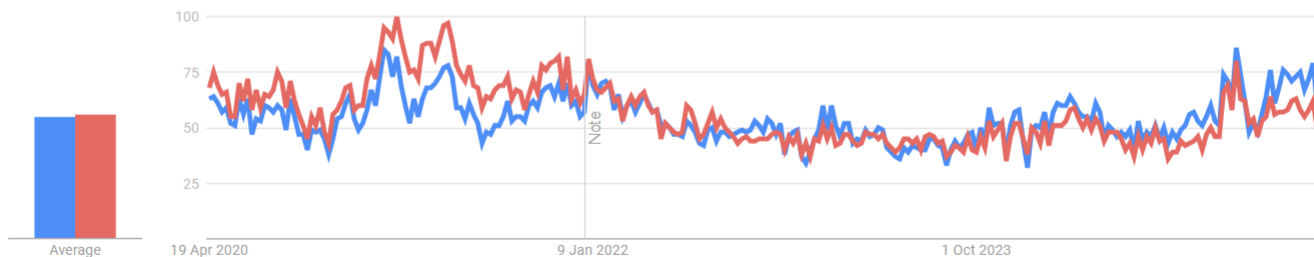




TABLE OF CONTENTS

01

Disclaimer

02

Technical Analysis

03

Data

04

Data may differ

05

Python libraries

06

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](https://www.stooq.com/q/d/?s=pko)
 - [stooq.com/q/d/?s=pzu](https://www.stooq.com/q/d/?s=pzu)
- GPW Price archive (.XLS, scraping)

ranaroussi

yfinance

Public

Sponsor

Watch 249

Fork 2.6k

Starred 16.5k

main

19 Branches

106 Tags

Go to file

Add file

Code

ranaroussi

Updated link

4ecd6a6 · 2 weeks ago

1,475 Commits

.github	Bug report formatting	last month
doc	Merge pull request #2372 from ranaroussi/dev	2 weeks ago
tests	Fix history caching and allow period in data retrieval	2 weeks ago
yfinance	Version 0.2.55	2 weeks ago
.gitignore	Add Sphinx Documentation	5 months ago
.travis.yml	removed python 3.5 support	4 years ago
CHANGELOG.rst	Version 0.2.55	2 weeks ago
CODE_OF_CONDUCT.md	Create CODE_OF_CONDUCT.md	2 years ago
LICENSE.txt	new license	6 years ago
MANIFEST.in	first commit	8 years ago
README.md	Updated link	2 weeks ago
meta.yaml	Version 0.2.55	2 weeks ago
pyrightconfig.json	Update pyrightconfig.json	7 months ago
requirements.txt	Refactor earnings dates to use API instead of HTML	3 months ago
setup.cfg	renamed file	6 years ago
setup.py	Refactor earnings dates to use API instead of HTML	3 months ago

About

Download market data from Yahoo! Finance's API

yfinance-python.org/

python

pandas

yahoo-finance-api

market-data

stock-data

financial-data

yahoo-finance

fix-yahoo-finance

- Readme
- Apache-2.0 license
- Code of conduct
- Activity
- 16.5k stars
- 249 watching
- 2.6k forks
- Report repository

Releases 92

0.2.55

Latest

2 weeks ago

+ 91 releases

Sponsor this project

- patreon.com/ranaroussi
- https://paypal.me/ranaroussi

Packages

No packages published

README

Code of conduct

Apache-2.0 license



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...

Learn more

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](#)

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
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](#)
[Calendar](#)
[Profile](#)
[Shareholders](#)
[Operations](#)

Ulubione

Start date:
eg. Jan 15 2008

May

152023

End date:

May

152023

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](#)
[Calendar](#)
[Profile](#)
[Shareholders](#)
[Operations](#)

Ulubione

Start date:
eg. Jan 15 2008

May152023

End date:

May152023

[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:pk", 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 337 Fork 1.8k Starred 10.5k

master 4 Branches 44 Tags

Go to file

Add file

Code

mrjbq7	tools: better escapes for re.sub ✓	0c957ed · 2 weeks ago	689 Commits
.github/workflows	.github: remove 3.7	3 months ago	
docs	docs: update arg names	9 months ago	
talib	bump version to 0.6.4 dev	2 weeks ago	
tests	tests: fix for 0.6.4	3 months ago	
tools	tools: better escapes for re.sub	2 weeks ago	
.gitignore	tools: Update scripts for generating code	9 years ago	
AUTHORS	add AUTHORS file	13 years ago	
CHANGELOG	bump version to 0.6.4 dev	2 weeks ago	
CITATION.cff	Adding a citation file, I'm not sure how best to handle multi...	3 years ago	
COPYRIGHT	update changelog and dev docs.	12 years ago	
DEVELOPMENT	tools: Update scripts for generating code	9 years ago	
Dockerfile	Switch to pytest from nose.	4 years ago	
LICENSE	Adding license.	13 years ago	
MANIFEST.in	Include *.pxi in the source tar.gz	5 months ago	
Makefile	Switch to pytest from nose.	4 years ago	
README.md	README: link to install	3 months ago	
pyproject.toml	bump version to 0.6.4 dev	2 weeks ago	
requirements.txt	Upgrade to numpy 2.0	5 months ago	
requirements_dev.txt	Initial support for polars.Series and polars.DataFrame.	4 years ago	

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
- View license
- Cite this repository
- Activity
- Custom properties
- 10.5k stars
- 337 watching
- 1.8k forks
- Report repository

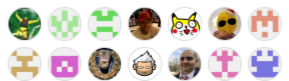
Releases

44 tags

Packages

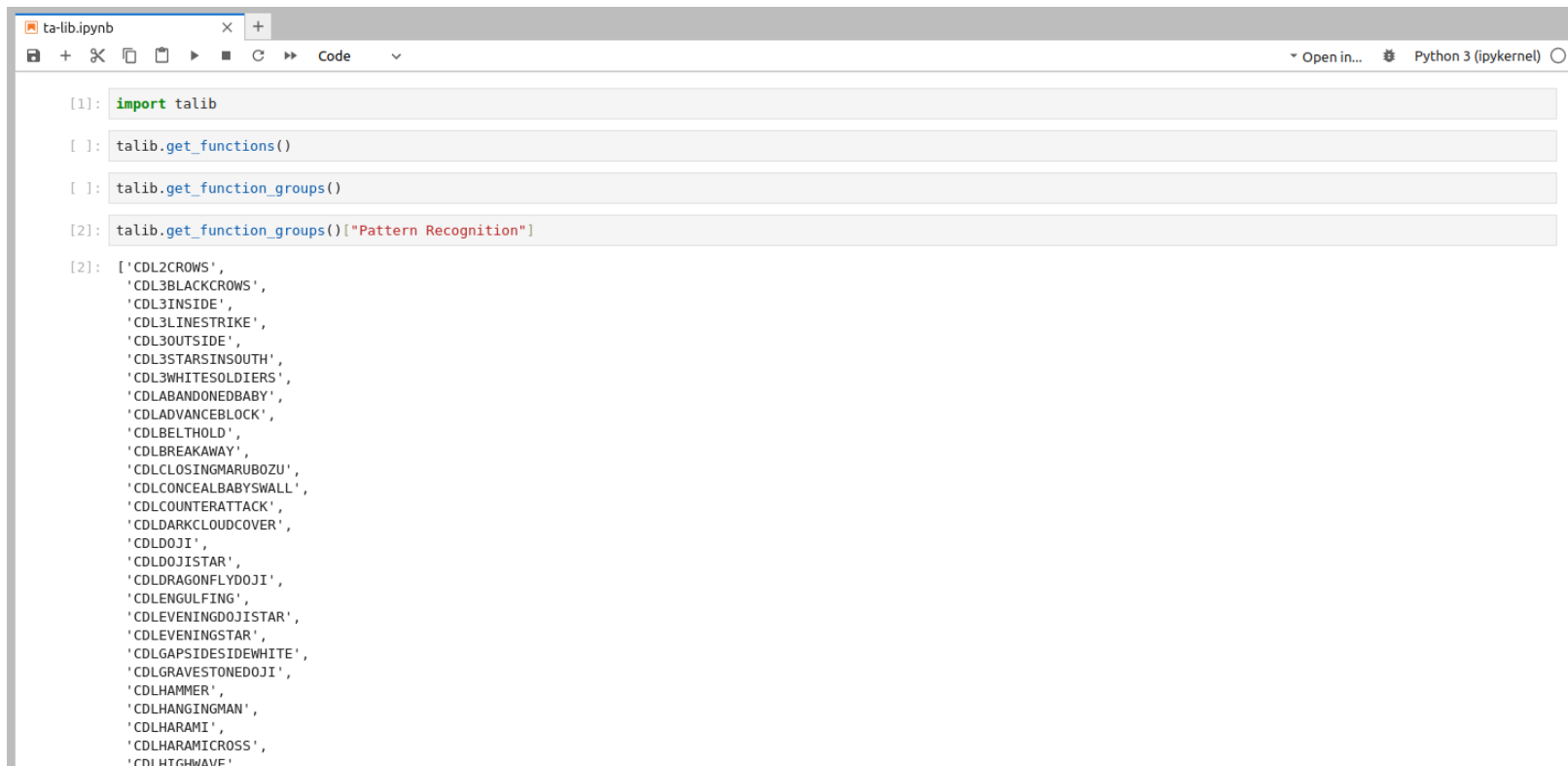
No packages published

Contributors 32



+ 18 contributors

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 34 candlestick pattern indicator names:

```
[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](#)].



Watchlist ▼				+		...	
Symbol	Last	Chg	Chg%				
▼ INDICES							
SPX •	5308.14	61.45	1.17%				
NDQ •	18596.65	273.88	1.49%				
DJI •	39908.01	349.89	0.88%				
VIX ^D •	12.45	-0.97	-7.23%				
DXY	104.171	-0.112	-0.11%				
▼ STOCKS							
AAPL •	189.72	2.29	1.22%				
TSLA •	173.99	-3.56	-2.01%				
NFLX •	613.52	-0.14	-0.02%				
▼ FUTURES							
USOIL	79.01	0.21	0.27%				
GOLD	2389.37	3.24	0.14%				
SILVER	29.573	-0.052	-0.17%				
AAPL 0.60 0.00 Q3 '23 Q4 '23 Q1 '24 Q2 '24 Q3 '24 ■ Actual □ Estimate							
Dividends 14.93% ■ Earnings retained ■ Payout ratio (TTM)							
Dividend yield TTM				0.51%			
Last payment				0.25			
Last ex-date				May 10, 2024			

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)

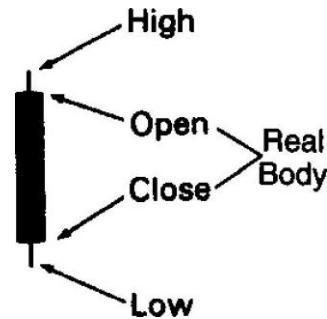
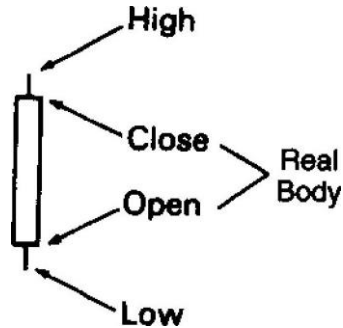
[5]: Date
2024-04-17    14.285714
2024-04-18   -28.571429
2024-04-19   -35.714286
2024-04-22   -35.714286
2024-04-23   -35.714286
2024-04-24   -35.714286
2024-04-25   -35.714286
2024-04-26   -35.714286
2024-04-29   -35.714286
2024-04-30   -35.714286
2024-05-01   -35.714286
2024-05-02   -35.714286
2024-05-03    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

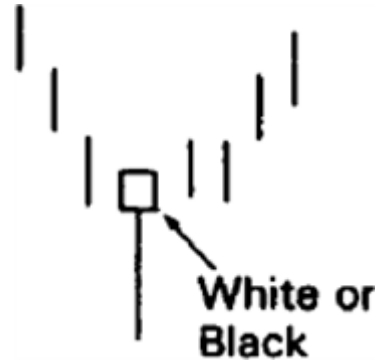
The **hammer** can be recognized by three criteria:

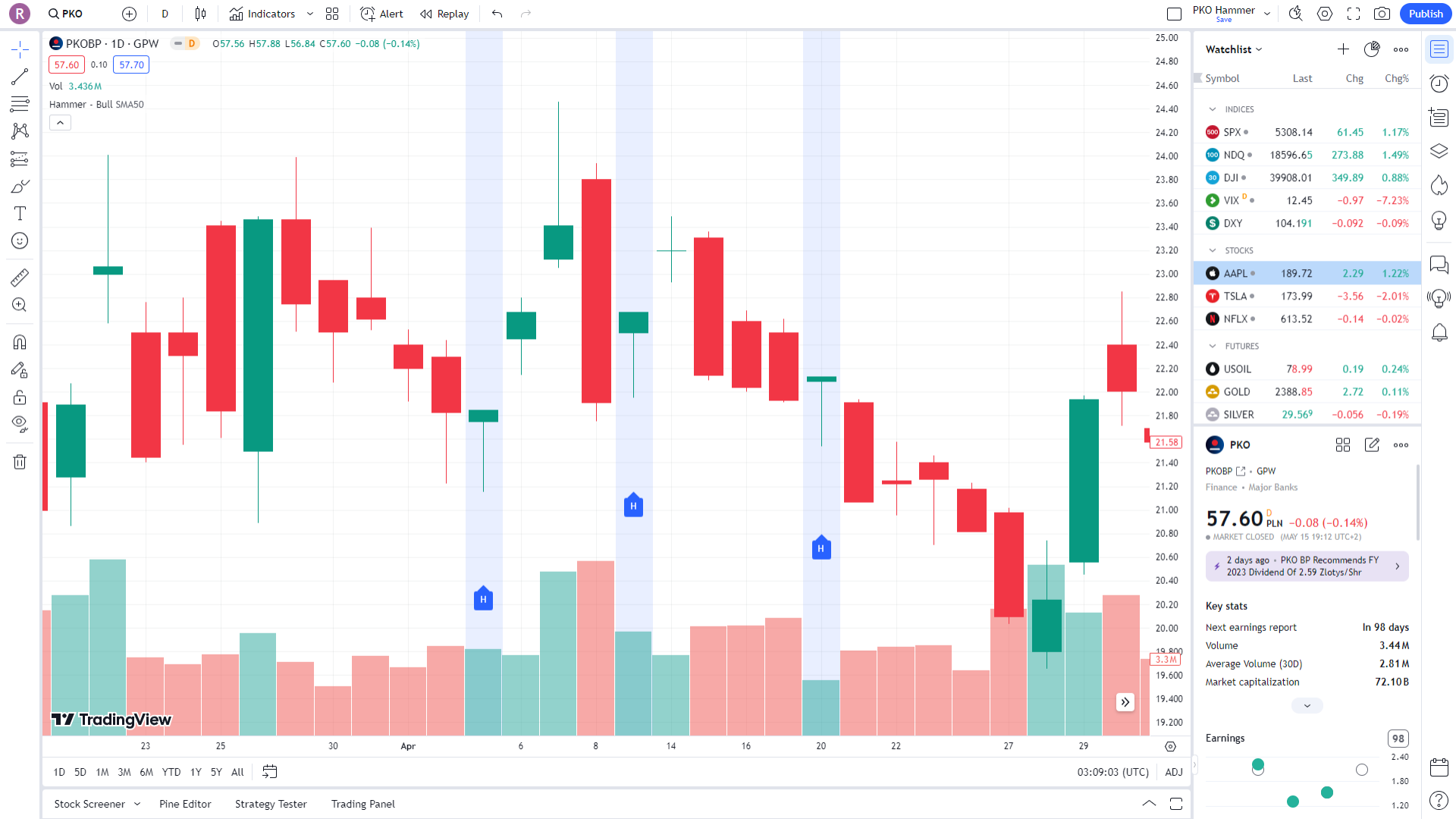
1. The real body is at the upper end of the trading range. The color of the real body is not important.
2. It has a long lower shadow that should be at least twice the height of the real body.
3. It should have no, or a very short, upper shadow [[src](#)].



Hammer Candlestick

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





TA-Lib: Abstract API

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

[1]: API_TOKEN = " "

[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

Watch 113 Fork 1.2k Starred 6k

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
- Code of conduct
- Activity
- 6k stars
- 113 watching
- 1.2k forks
- Report repository

Releases 5

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

+ 4 releases

Packages

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

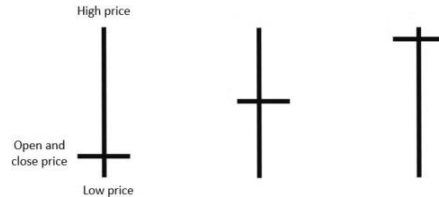
There are three criteria for an engulfing pattern:

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

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

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

- Readme
- MIT license
- Activity
- 4.6k stars
- 150 watching
- 1.1k forks
- Report repository

Releases

65 tags

Sponsor this project

bukosabino

Dario López Padial

tidelift.com/funding/github/pypi/ta

Learn more about GitHub Sponsors

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 (as of 04.04.2025)

TA-Lib (talib)

pros

- 10.5K stars
- 32 contributors
- 456 closed issues
- actively developing
- supports Polars
- speed

Pandas TA

pros

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

cons

- no docstring for `df.ta`
- not actively developing

Technical Analysis

pros

- 4.6K stars
- 31 contributors
- 104 closed issues

cons

- no candlestick
- not actively developing

06

Learning materials

Yale

Financial Markets



Instructor: [Robert Shiller](#)

Enroll for Free
Starts Feb 8

Financial aid available

2,131,783 already enrolled

Included with [coursera PLUS](#) • [Learn more](#)

7 modules

Gain insight into a topic and learn the fundamentals.

4.8 ★

(29,559 reviews)

Beginner level

No prior experience required

Flexible schedule

Approx. 33 hours

Learn at your own pace

👍 97%

Most learners liked this course

About

Modules

Recommendations

Testimonials

Reviews

Skills you'll gain

Behavioral Finance

Financial Markets

Finance

Behavioral Economics

Details to know



[What you should know](#)[General information](#)[Frequent questions](#)[Contact](#)

Santander Course

Inwestowanie na giełdzie SGH & GPW 2023



Szkola Główna Handlowa w Warszawie

Skills

Online

● Ended process



What you need to know



FOR YOU IF YOU ARE

Open to everyone

Summary

Poznaj świat giełdy i zdobądź certyfikat Szkoły Głównej Handlowej w Warszawie, Giełdy Papierów Wartościowych i Santander Universidades!

[Read more](#)

[What you should know](#)[General information](#)[Frequent questions](#)[Contact](#)

Santander Course

Szkoła Giełdowa GPW & SGH 2024



Szkoła Główna Handlowa w Warszawie

Financial health

Skills

Online

● Ended process



What you need to know



FOR YOU IF YOU ARE

Open to everyone

Summary

Rozpocznij przygodę ze światem giełdy! Mamy 1000 miejsc i dwa poziomy zaawansowania — możesz uczestniczyć w obu! Otrzymasz dostęp do platformy na 3 miesiące. Dla 100 najlepszych uczestników.

[Read more](#)

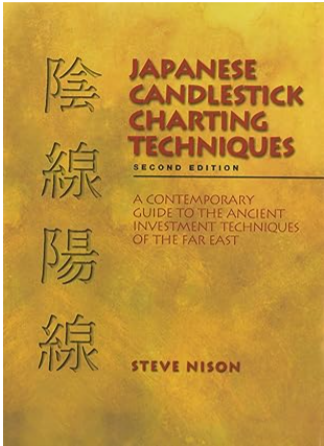
General information

books

Categories New & Trending Deals & Rewards Best Sellers & More Memberships Communities More Your Books

Shop top categories that ship internationally

Kindle Store > Kindle eBooks > Business & Money



Read sample

Follow the author



Steve Nison

Follow

Japanese Candlestick Charting Techniques: A Contemporary Guide to the Ancient Investment Techniques of the Far East, Second Edition 2nd

Edition, Kindle Edition

by Steve Nison (Author) | Format: Kindle Edition

4.7 2,305 ratings

See all formats and editions

A form of technical analysis, Japanese candlestick charts are a versatile tool that can be fused with any other technical tool, and will help improve any technician's market analysis. They can be used for speculation and hedging, for futures, equities or anywhere technical analysis is applied. Seasoned technicians will discover how joining Japanese candlesticks with other technical tools can create a powerful synergy of techniques; amateurs will find out how effective candlestick charts are as a stand-alone charting method. In easy-to-understand language, this title delivers to the reader the author's years of study, research and practical experience in this increasingly popular and dynamic approach to market analysis. The comprehensive coverage includes everything from the basics, with hundreds of examples showing how candlestick charting techniques can be used in almost any market.

ISBN-13	Edition	Publisher	Publication date	Language
978-0735201811	2nd	Prentice Hall Press	November 1, 2001	English

Due to its large file size, this book may take longer to download

Report an issue with this product or seller

This title is only available on select devices and the latest version of the Kindle app. Please refer to the supported device list before purchase. Available on these devices

Kindle \$13.99 Available instantly

Hardcover \$60.99

Other Used and New from \$40.00

\$13.99

Buy now with 1-Click

By placing your order, you're purchasing a license to the content and you agree to the Kindle Store Terms of Use.

Sold by Penguin Group (USA) LLC. Price set by seller.

eBook features:

- Highlight, take notes, and search in the book
- In this edition, page numbers are just like the physical edition

Read with our free app Deliver to your Kindle Library

Buy for others

Give as a gift or purchase for a team or group. Learn more

Buy for others

Send a free sample Deliver to your Kindle Library

Add to List

Customers who read this book also read

Page 1 of 10





RUSLAN KORNIICHUK

Software and Platform Engineer in Poland



Hire me

Solid experience of 10+ years in IT. Former Software Engineer and Architect at Fortune 500 companies. Core areas: Cloud Computing, and Software Engineering. Especially interested in Platform Engineering. Click the button above to hire me.



DONATE TO UKRAINE ARMY FUNDRAISER

Select the destination of your assistance

ARMY ASSISTANCE

SUPPORT THE FUND

All funds raised to help the army will be spent exclusively on purchases for the Armed Forces of Ukraine and other components of the Defense Forces.

Payment method

PAYMENT BY CARD

SWIFT TRANSFERS

CRYPTOCURRENCY

Regularity

ONE TIME

SUBSCRIPTION EVEN BETTER

Payment currency

UAH, ₴

USD, \$

EUR, €

Amount of donation*

€ 10

Email*

example@example.com

☐ I consent to the processing of my email address to receive email newsletters (twice a month), invitations and receipts.

PAY

 Payment secured

tinyurl.com/PYCONLT4

