

The background is a blurred photograph of a desk. On the left, a laptop screen displays a line graph with a sharp upward trend. In the center, a white clock with three circular faces is visible. To the right of the clock, a white candle sits in a glass holder. The entire scene is overlaid with a semi-transparent blue filter.

Technical Analysis libraries in Python

Ruslan Kornichuk | 06.02.2025



Technical Analysis

Search term



Technical analysis

Topic



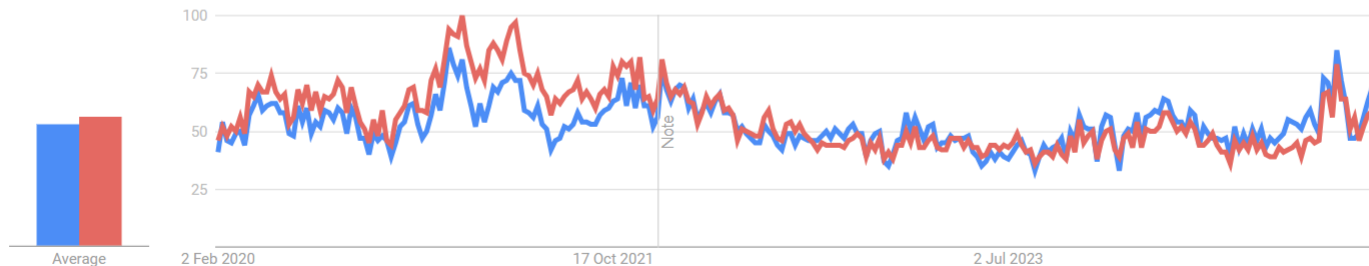
+ Add comparison

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 



Watchlist

Symbol

Last

Chg

Chg%

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
- 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)

yfinance

Public

Sponsor

Watch 244

Fork 2.5k

Starred 15.6k

main

19 Branches

103 Tags

Go to file

Add file

<> Code

ValueRaider Version 0.2.52	4ec93d9 · 3 weeks ago	🕒 1,412 Commits
.github	Remove mkdocs	2 months ago
doc	Fix typo in screener RST doc file	3 weeks ago
tests	Merge pull request #2207 from ranaroussi/feature/improve-...	3 weeks ago
yfinance	Version 0.2.52	3 weeks ago
.DS_Store	Add Sphinx Documentation	3 months ago
.gitignore	Add Sphinx Documentation	3 months ago
.travis.yml	removed python 3.5 support	4 years ago
CHANGELOG.rst	Version 0.2.52	3 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	Add Market summary & status	2 months ago
meta.yaml	Version 0.2.52	3 weeks ago
pyrightconfig.json	Update pyrightconfig.json	5 months ago
requirements.txt	Add missing dependencies to requirements.txt	last month
setup.cfg	renamed file	6 years ago
setup.py	Replace dead 'appdirs' package with 'platformdirs'	11 months ago

About

Download market data from Yahoo! Finance's API

[ranaroussi.github.io/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
- Activity
- 15.6k stars
- 244 watching
- 2.5k forks
- Report repository

Releases 89

0.2.52

Latest

3 weeks ago

+ 88 releases

Sponsor this project

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

Packages

No packages published



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)

7 Feb, 17:04 **67.48** **+1.26** **(+1.90%)**

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

Feb 1 2025

End date:

Feb 7 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
5	7 Feb 2025	66.3	67.7	66.22	67.48	+1.90%	+1.26	4,210,373
4	6 Feb 2025	64.36	66.34	64.3	66.22	+3.76%	+2.40	3,755,019
3	5 Feb 2025	64.88	64.98	63.3	63.82	-2.18%	-1.42	2,171,120
2	4 Feb 2025	65.76	65.88	64.76	65.24	-0.79%	-0.52	1,311,311
1	3 Feb 2025	65.32	66.08	64.62	65.76			1,608,418

[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

06-02-2025



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	2.7500	2.8100	2.7500	2.8000	1.82	32.80
08OCTAVA	PLN	0.0000	0.0000	0.0000	0.9600	0.00	0.00
11BIT	PLN	199.0000	201.5000	194.6000	198.8000	2.79	3,863.05
3RGAMES	PLN	0.4280	0.4400	0.4060	0.4120	-1.90	493.90
4MASS	PLN	6.9500	6.9900	6.7400	6.8700	-0.72	405.55

04

Data may differ

Archiwum notowań

Skorzystaj z archiwalnych danych giełdowych GPW. Pamiętaj, że na kartach poszczególnych instrumentów również możesz przeszukać archiwalne dane.

Wybierz kategorię instrumentu

akcje



Wybierz instrument (opcjonalnie)

-- wybierz --



Wybierz dzień

15-05-2023



Pokaż wyniki



Pobierz (XLS)

Pełna wersja tabeli

Nazwa ***	Waluta ***	Kurs otwarcia ***	Kurs maksymalny ***	Kurs minimalny ***	Kurs zamknięcia ***	Zmiana kursu % ***	Wartość obrotu (w tys.) ***
PKOBP	PLN	31,6300	31,6700	31,0600	31,3700	0,06	46 996,85

Dane historyczne: Powszechna Kasa Oszczędności Bank Polski SA (PKO)

15 maj, 17:0157.60-0.08 (-0.14%)

[PZU](#) +1.81% | [PKN](#) +0.04% | [WIG20](#) -0.07%

Menu symbolu PKO

[Ogólnie](#)
[Wykres](#)
[Wykres HTML5](#)
[Analiza techniczna](#)
▶ **Dane historyczne**
[Wiadomości](#)
[Kalendarium](#)
[Profil](#)
[Akcjonariat](#)
[Operacje](#)

[Ulubione](#)

Data początku:
np. 15 Sty 2008
15maj2023

Data końca:
15maj2023

[Domyślny zakres czasowy](#)

Pokaż

Interwał:
☒ Dzienny
☐ Tygodniowy
☐ Miesięczny
☐ Kwartałny
☐ Roczny

Pomijaj:
☐ splity
☐ dywidendy
☐ prawa poboru
☐ prawa nabycia
☐ prawa objęcia
☐ denominacje
☐ inne

Prostszy dostęp do danych PKO

W polu podawania nazwy tikera wpisz "d:pko", a Stooq od razu przeniesie Cię na stronę z danymi historycznymi.

[English](#)
polski

Wartości historyczne PKO							
<< < > >>							
Nr.	Data	Otwarcie	Najwyższy	Najniższy	Zamknięcie	Zmiana	Wolumen
1	15 maj 2023	30.8141	30.853	30.2588	30.5608		1,539,667

Nazwa ***	Waluta ***	Kurs otwarcia ***	Kurs maksymalny ***	Kurs minimalny ***	Kurs zamknięcia ***	Zmiana kursu % ***	Wartość obrotu (w tys.) ***
PKOBP	PLN	31,6300	31,6700	31,0600	31,3700	0,06	46 996,85

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Menu symbolu PKO

[Ogólnie](#)
[Wykres](#)
[Wykres HTML5](#)
[Analiza techniczna](#)
► **Dane historyczne**
[Wiadomości](#)
[Kalendarium](#)
[Profil](#)
[Akcjonariat](#)
[Operacje](#)

Ulubione

Data początku:
np. 15 Sty 2008

15

maj

2023

Data końca:

15

maj

2023

[Domyślny zakres czasowy](#)

Pokaż

Interwał:

☒ Dzienny
☐ Tygodniowy
☐ Miesięczny
☐ Kwartalny
☐ Roczny

Pomijaj:

☐ splity
☒ dywidendy
☐ prawa poboru
☐ prawa nabycia
☐ prawa objęcia
☐ denominacje
☐ inne

Prostszy dostęp do danych PKO

W polu podawania nazwy tikera wpisz "d:pk0", a Stooq od razu przeniesie Cię na stronę z danymi historycznymi.

[English](#)
polski

Wartości historyczne PKO							
<< < > >>							
Nr.	Data	Otwarcie	Najwyższy	Najniższy	Zamknięcie	Zmiana	Wolumen
1	15 maj 2023	31.630029829439	31.669959866674	31.06002598171	31.370022671813		1,499,950

Nazwa ***	Waluta ***	Kurs otwarcia ***	Kurs maksymalny ***	Kurs minimalny ***	Kurs zamknięcia ***	Zmiana kursu % ***	Wartość obrotu (w tys.) ***
PKOBP	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 334

Fork 1.8k

Starred 10.2k

master

4 Branches

43 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

View license

Cite this repository

Activity

Custom properties

10.2k stars

334 watching

1.8k forks

[Report repository](#)

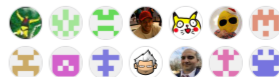
Releases

43 tags

Packages

No packages published

Contributors 32

[+ 18 contributors](#)

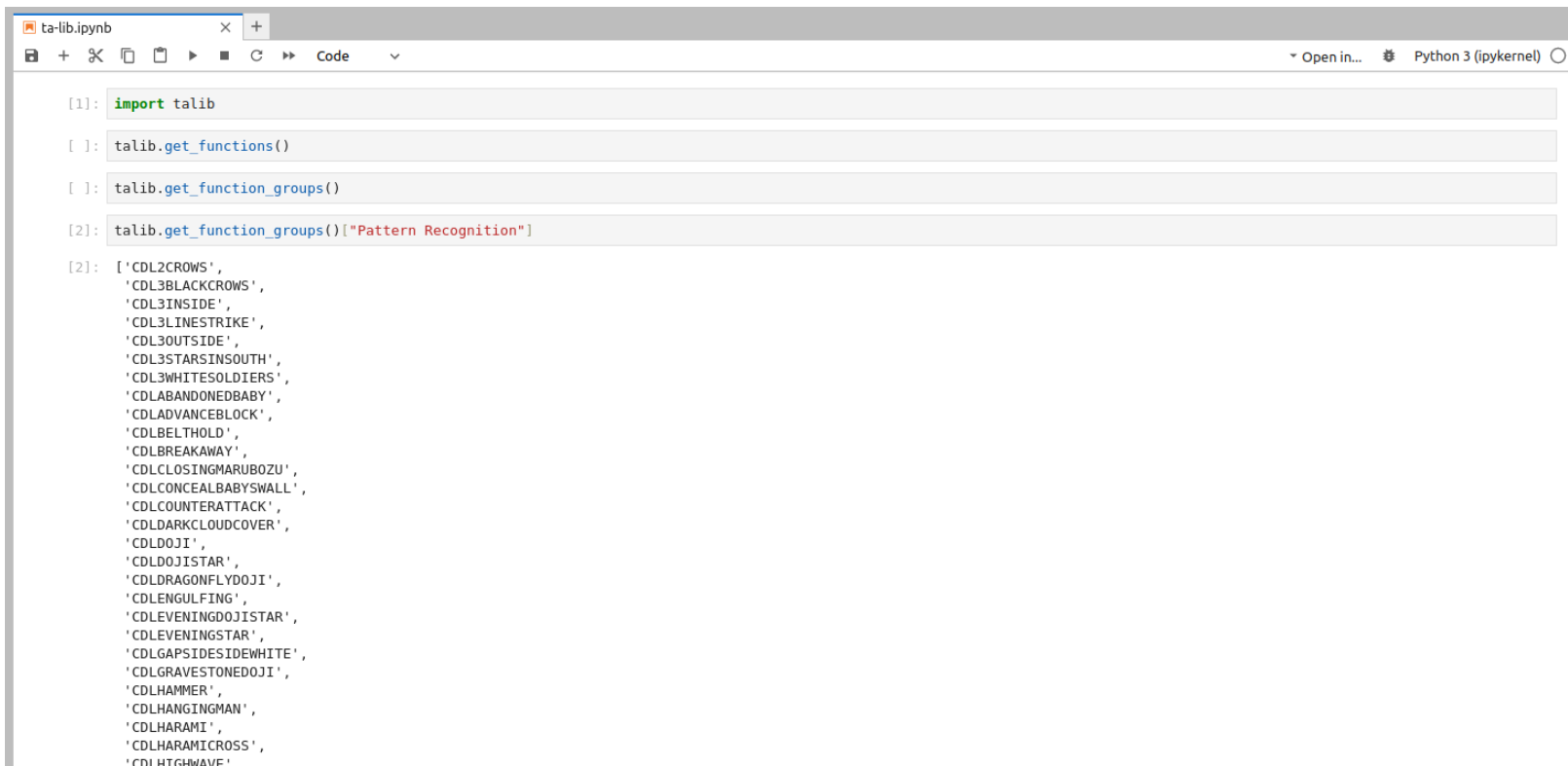
mrjbq7 update changelog ✓

1ece7f1 · 2 hours ago

685 Commits

.github/workflows	.github: remove 3.7	2 weeks ago
docs	docs: update arg names	7 months ago
talib	talib: updating docs for new functions	4 days ago
tests	tests: fix for 0.6.4	3 weeks ago
tools	tools: fixes for windows locations	4 days ago
.gitignore	tools: Update scripts for generating code	9 years ago
AUTHORS	add AUTHORS file	13 years ago
CHANGELOG	update changelog	2 hours 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	3 months ago
Makefile	Switch to pytest from nose.	4 years ago
README.md	README: link to install	2 weeks ago
pyproject.toml	Adding new indicators: ACCBANDS, AVGDEV, IMI	4 days ago
requirements.txt	Upgrade to numpy 2.0	3 months ago
requirements_dev.txt	Initial support for polars.Series and polars.DataFrame.	4 years 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 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](#)].



TA-Lib: Momentum Indicators

```
ta-lib.ipynb
+ -
Open in... 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
```



Hammer Candlestick

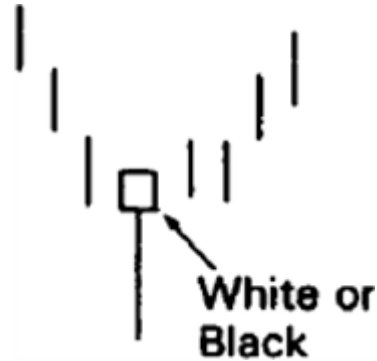
The **hammer** can be recognized by three criteria:

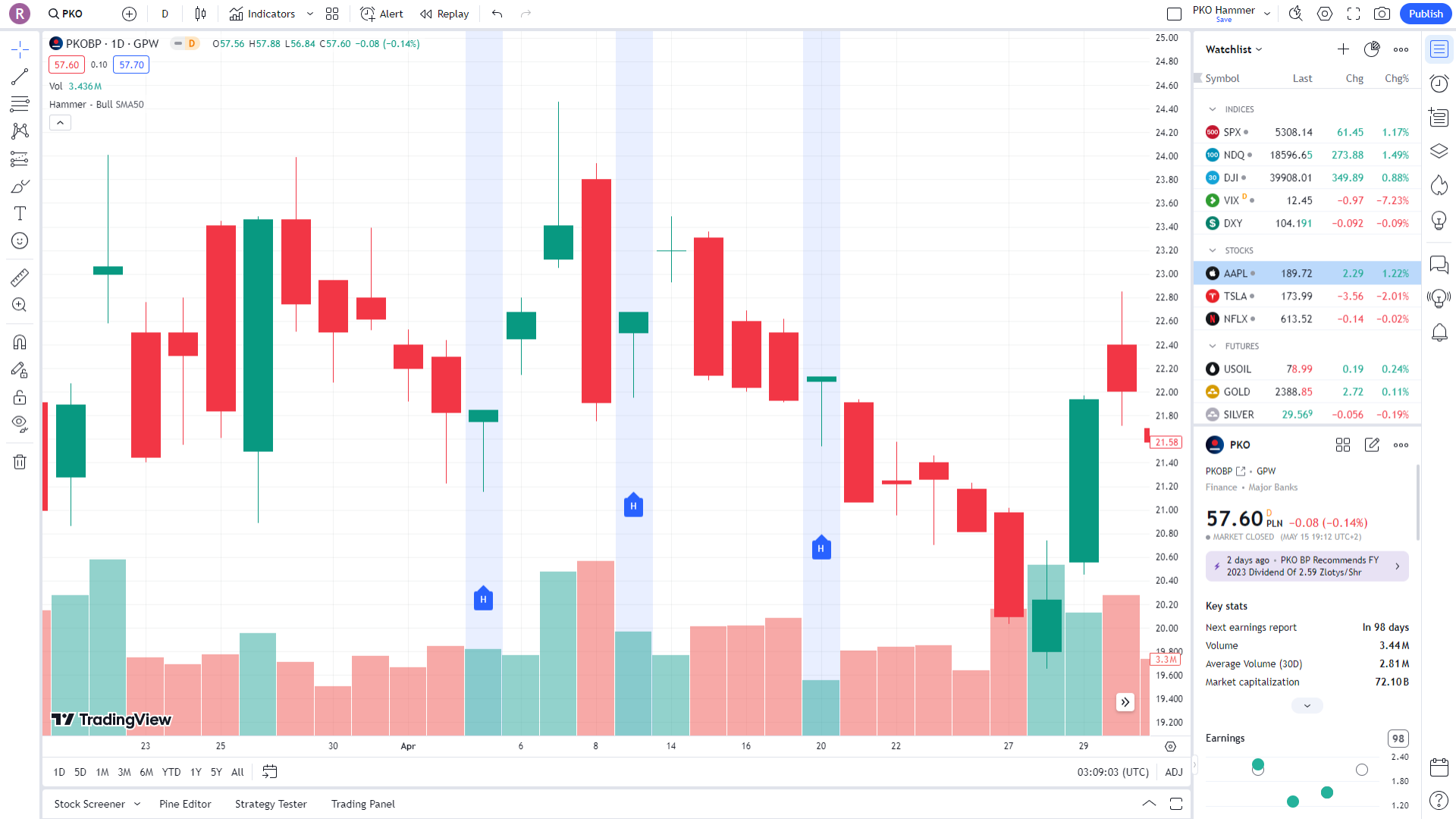
1. The real body is at the upper end of the trading range. The color of the real body is not important.
2. It has a long lower shadow that should be at least twice the height of the real body.
3. It should have no, or a very short, upper shadow [[src](#)].



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

twopirllc pandas-ta Public

Watch 109

Fork 1.1k

Starred 5.7k

main

3 Branches

6 Tags

Go to file

Add file

Code

About

twopirllc Update setup.py

b465491 · 8 months ago

586 Commits

.github/ISSUE_TEMPLATE	Update bug report	3 years ago
data	ENH strategy method params and col_numbers kwargs MAI...	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 TL : 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	8 months ago

[README](#) [Code of conduct](#) [MIT license](#)

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
☆ 5.7k stars
👁 109 watching
🍴 1.1k 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, risefall3methods, 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)

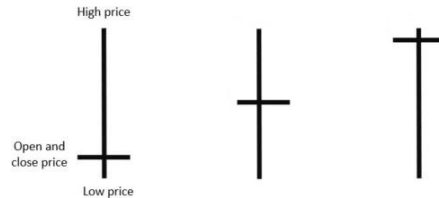
[5]: df.tail(5)
```

	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 prior 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

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.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.yaml	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	

Technical Analysis: Trend

```
ta.ipynb
+ 🔍 📄 ▶ ⏏ ⌂ ⌕ Python 3 (ipykernel) 🔍
```

```
[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
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 08.02.2025)

TA-Lib (talib)

pros

- 10.2K stars
- 32 contributors
- 450 closed issues
- actively developing
- supports Polars
- speed

Pandas TA

pros

- 5.7K stars
- 39 contributors
- 504 closed issues
- supports strategies

cons

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

Technical Analysis

pros

- 4.5K stars
- 31 contributors
- 104 closed issues

cons

- no candlestick
- not actively developing

06

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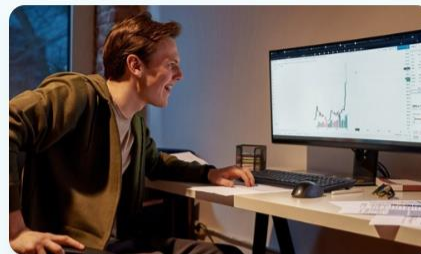


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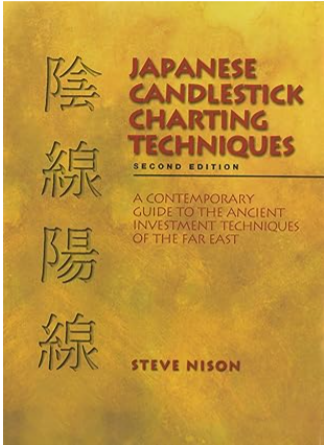
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