

jhTAlib

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jhTAlib

Technical Analysis Library Time-Series

You can use and import it for your:

- Technical Analysis Software
- Charting Software
- Backtest Software
- Trading Robot Software
- Trading Software in general

Work in progress...

Depends only on

- The Python Standard Library

Docs

- .html
- .epub
- .json
- .odt
- .pdf
- .rst

- .rtf
 - .xml
-

Install

From PyPI:

```
$ [sudo] pip3 install jhtalib
```

From source - source mirror 1 - source mirror 2:

```
$ git clone https://github.com/joosthoeks/jhTALib.git
$ cd jhTALib
$ [sudo] pip3 install -e .
```

Update

From PyPI:

```
$ [sudo] pip3 install --upgrade jhtalib
```

From source - source mirror 1 - source mirror 2:

```
$ cd jhTALib
$ git pull [upstream master]
```

In Colab

From PyPI:

```
!pip install --upgrade jhtalib
import jhtalib as jhta
```

From source - source mirror 1 - source mirror 2:

```
!git clone [-b branch-name] https://github.com/joosthoeks/jhTALib.git
%cd '/content/jhTALib'
import jhtalib as jhta
%cd '/content'
!rm -rf ./jhTALib/
```

Examples

```
$ cd example/
```

Example 1

```
$ python3 example-1-plot.py
```

or

<https://colab.research.google.com/github/joosthoeks/jhTAlib/blob/master/example/example-1-plot.ipynb>

Example 2

```
$ python3 example-2-plot.py
```

or

<https://colab.research.google.com/github/joosthoeks/jhTAlib/blob/master/example/example-2-plot.ipynb>

Example 3

```
$ python3 example-3-plot.py
```

or

<https://colab.research.google.com/github/joosthoeks/jhTAlib/blob/master/example/example-3-plot.ipynb>

Example 4

```
$ python3 example-4-plot-quandl.py
```

or

<https://colab.research.google.com/github/joosthoeks/jhTAlib/blob/master/example/example-4-plot-quandl.ipynb>

Example 5

```
$ python3 example-5-plot-quandl.py
```

or

<https://colab.research.google.com/github/joosthoeks/jhTAlib/blob/master/example/example-5-plot-quandl.ipynb>

Example 6

```
$ python3 example-6-plot-quandl.py
```

or

<https://colab.research.google.com/github/joosthoeks/jhTAlib/blob/master/example/example-6-plot-quandl.ipynb>

Example 7

```
$ python3 example-7-quandl-2-df.py
```

or

<https://colab.research.google.com/github/joosthoeks/jhTAlib/blob/master/example/example-7-quandl-2-df.ipynb>

Example 8

```
$ python3 example-8-alphavantage-2-df.py
```

or

<https://colab.research.google.com/github/joosthoeks/jhTAlib/blob/master/example/example-8-alphavantage-2-df.ipynb>

Example 9

```
$ python3 example-9-cryptocompare-2-df.py
```

or

<https://colab.research.google.com/github/joosthoeks/jhTAlib/blob/master/example/example-9-cryptocompare-2-df.ipynb>

Example 10

DF NumPy Pandas

<https://colab.research.google.com/github/joosthoeks/jhTAlib/blob/master/example/example-10-df-numpy-pandas.ipynb>

Example 11

Basic Usage

<https://colab.research.google.com/github/joosthoeks/jhTAlib/blob/master/example/example-11-basic-usage.ipynb>

Test

```
$ cd test/  
$ python3 test.py
```

Reference

```
import jhtalib as jhta
```

Behavioral Techniques

ATH | All Time High | DONE

- dict of lists of floats = jhta.ATH(df, price='High')
-

LMC | Last Major Correction | DONE

- dict of lists of floats = `jhta.LMC(df, price='Low', price_high='High')`
-

PP | Pivot Point | DONE

- dict of lists of floats = `jhta.PP(df, high='High', low='Low', close='Close')`
 - [https://en.wikipedia.org/wiki/Pivot_point_\(technical_analysis\)](https://en.wikipedia.org/wiki/Pivot_point_(technical_analysis))
-

FIBOPR | Fibonacci Price Retracements | DONE

- dict of lists of floats = `jhta.FIBOPR(df, price='Close')`
-

FIBTR | Fibonacci Time Retracements |

-
-

GANNPR | W. D. Gann Price Retracements | DONE

- dict of lists of floats = `jhta.GANNPR(df, price='Close')`
-

GANNTR | W. D. Gann Time Retracements |

-
-

JDN | Julian Day Number | DONE

- `jdn = jhta.JDN(utc_year, utc_month, utc_day)`
 - https://en.wikipedia.org/wiki/Julian_day
-

JD | Julian Date | DONE

- `jd = jhta.JD(utc_year, utc_month, utc_day, utc_hour, utc_minute, utc_second)`
 - https://en.wikipedia.org/wiki/Julian_day
-

SUNC | Sun Cycle |

-
-

MERCURYC | Mercury Cycle |

-
-

VENUSC | Venus Cycle |

-
-

EARTHHC | Earth Cycle |

-
-

MARSC | Mars Cycle |

-
-

JUPITERC | Jupiter Cycle |

-
-

SATURNC | Saturn Cycle |

-
-

URANUSC | Uranus Cycle |

-

NEPTUNEC | Neptune Cycle |

-

PLUTOOC | Pluto Cycle |

-

MOONC | Moon Cycle |

-

Candlestick

CDLBODYYS | Candle Body Size | DONE

- list of floats = `jhta.CDLBODYYS(df, open='Open', close='Close')`
- <https://www.tradeciety.com/understand-candlesticks-patterns/>

CDLWICKS | Candle Wick Size | DONE

- list of floats = `jhta.CDLWICKS(df, high='High', low='Low')`
- <https://www.tradeciety.com/understand-candlesticks-patterns/>

CDLUPPSHAS | Candle Upper Shadow Size | DONE

- list of floats = `jhta.CDLUPPSHAS(df, open='Open', high='High', close='Close')`
- <https://www.tradeciety.com/understand-candlesticks-patterns/>

CDLLOWSHAS | Candle Lower Shadow Size | DONE

- `list of floats = jhta.CDLLOWSHAS(df, open='Open', low='Low', close='Close')`
 - <https://www.tradeciety.com/understand-candlesticks-patterns/>
-

CDLBODYP | Candle Body Percent | DONE

- `list of floats = jhta.CDLBODYP(df, open='Open', close='Close')`
-

CDLBODYM | Candle Body Momentum | DONE

- `list of floats = jhta.CDLBODYM(df, n, open='Open', close='Close')`
 - book: Trading Systems and Methods
-

GAP | Gap | DONE

- `list of floats = jhta.GAP(df, high='High', low='Low', close='Close')`
-

QSTICK | Qstick | DONE

- `list of floats = jhta.QSTICK(df, n, open='Open', close='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=Qstick.htm>
-

SHADOWT | Shadow Trends | DONE

- `dict of lists of floats = jhta.SHADOWT(df, n, open='Open', high='High', low='Low', close='Close')`
 - book: The New Technical Trader
-

IMI | Intraday Momentum Index | DONE

- list of floats = `jhta.IMI(df, open='Open', close='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=IMI.htm>
-

INSBAR | Inside Bar | DONE

- list of booleans = `jhta.INSBAR(df, high='High', low='Low')`
-

OUTSBAR | Outside Bar | DONE

- list of booleans = `jhta.OUTSBAR(df, high='High', low='Low')`
-

Cycle Indicators

HT_DCPERIOD | Hilbert Transform - Dominant Cycle Period |

-
-

HT_DCPHASE | Hilbert Transform - Dominant Cycle Phase |

-
-

HT_PHASOR | Hilbert Transform - Phasor Components |

-
-

HT_SINE | Hilbert Transform - SineWave |

-
-

HT_TRENDLINE | Hilbert Transform - Instantaneous Trendline |

-
-

HT_TRENDMODE | Hilbert Transform - Trend vs Cycle Mode |

-
-

TS | Trend Score | DONE

- list of floats = `jhta.TS(df, n, price='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=TrendScore.htm>
-

Data

CSV2DF | CSV file 2 DataFeed | DONE

- dict of tuples of floats = `jhta.CSV2DF(csv_file_path, datetime='datetime', Open='Open', high='High', low='Low', close='Close', volume='Volume')`
-

CSVURL2DF | CSV file url 2 DataFeed | DONE

- dict of tuples of floats = `jhta.CSVURL2DF(csv_file_url, datetime='datetime', open='Open', high='High', low='Low', close='Close', volume='Volume')`
-

DF2CSV | DataFeed 2 CSV file | DONE

- csv file = `jhta.DF2CSV(df, csv_file_path, datetime='datetime', Open='Open', high='High', low='Low', close='Close', volume='Volume')`
-

DF2DFREV | DataFeed 2 DataFeed Reversed | DONE

- dict of tuples of floats = `jhta.DF2DFREV(df, datetime='datetime', open='Open', high='High', low='Low', close='Close', volume='Volume')`
-

DF2DFWIN | DataFeed 2 DataFeed Window | DONE

- dict of tuples of floats = `jhta.DF2DFWIN(df, start=0, end=10, datetime='datetime', open='Open', high='High', low='Low', close='Close', volume='Volume')`
-

DF_HEAD | DataFeed HEAD | DONE

- dict of tuples of floats = `jhta.DF_HEAD(df, n=5, datetime='datetime', open='Open', high='High', low='Low', close='Close', volume='Volume')`
-

DF_TAIL | DataFeed TAIL | DONE

- dict of tuples of floats = `jhta.DF_TAIL(df, n=5, datetime='datetime', open='Open', high='High', low='Low', close='Close', volume='Volume')`
-

DF2HEIKIN__ASHI | DataFeed 2 Heikin-Ashi DataFeed | DONE

- dict of tuples of floats = `jhta.DF2HEIKIN__ASHI(df, datetime='datetime', open='Open', high='High', low='Low', close='Close', volume='Volume')`
-

Event Driven

ASI | Accumulation Swing Index (J. Welles Wilder) | DONE

- list of floats = `jhta.ASI(df, L, open='Open', high='High', low='Low', close='Close')`
 - book: New Concepts in Technical Trading Systems
-

SI | Swing Index (J. Welles Wilder) | DONE

- `list of floats = jhta.SI(df, L, open='Open', high='High', low='Low', close='Close')`
 - book: New Concepts in Technical Trading Systems
-

SAVGP | Swing Average Price - previous Average Price | DONE

- `list of floats = jhta.SAVGP(df, open='Open', high='High', low='Low', close='Close')`
-

SAVGPS | Swing Average Price - previous Average Price Summation | DONE

- `list of floats = jhta.SAVGPS(df, open='Open', high='High', low='Low', close='Close')`
-

SCO | Swing Close - Open | DONE

- `list of floats = jhta.SCO(df, open='Open', close='Close')`
-

SCOS | Swing Close - Open Summation | DONE

- `list of floats = jhta.SCOS(df, open='Open', close='Close')`
-

SMEDP | Swing Median Price - previous Median Price | DONE

- `list of floats = jhta.SMEDP(df, high='High', low='Low')`
-

SMEDPS | Swing Median Price - previous Median Price Summation | DONE

- `list of floats = jhta.SMEDPS(df, high='High', low='Low')`
-

SPP | Swing Price - previous Price | DONE

- list of floats = jhta.SPP(df, price='Close')
-

SPPS | Swing Price - previous Price Summation | DONE

- list of floats = jhta.SPPS(df, price='Close')
-

STYPP | Swing Typical Price - previous Typical Price | DONE

- list of floats = jhta.STYPP(df, high='High', low='Low', close='Close')
-

STYPPS | Swing Typical Price - previous Typical Price Summation | DONE

- list of floats = jhta.STYPPS(df, high='High', low='Low', close='Close')
-

SWCLP | Swing Weighted Close Price - previous Weighted Close Price | DONE

- list of floats = jhta.SWCLP(df, high='High', low='Low', close='Close')
-

SWCLPS | Swing Weighted Close Price - previous Weighted Close Price Summation | DONE

- list of floats = jhta.SWCLPS(df, high='High', low='Low', close='Close')
-

Experimental

General

NORMALIZE | Normalize | DONE

- `list of floats = jhta.NORMALIZE(df, price_max='High', price_min='Low', price='Close')`
 - <https://machinelearningmastery.com/normalize-standardize-time-series-data-python/>
-

STANDARDIZE | Standardize | DONE

- `list of floats = jhta.STANDARDIZE(df, price='Close')`
 - <https://machinelearningmastery.com/normalize-standardize-time-series-data-python/>
-

REMAP | Remap | DONE

- `float = jhta.REMAP(x, old_min=0, old_max=1000, new_min=0, new_max=100)`
-

REMAPS | Remaps | DONE

- `list of floats = jhta.REMAPS(df, old_min=0, old_max=1000, new_min=0, new_max=100, price='Close')`
-

RATIO | Ratio | DONE

- `list of floats = jhta.RATIO(df1, df2, price1='Close', price2='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=Ratio.htm>
-

SPREAD | Spread | DONE

- `list of floats = jhta.SPREAD(df1, df2, price1='Close', price2='Close')`
-

CP | Comparative Performance | DONE

- `list of floats = jhta.CP(df1, df2, price1='Close', price2='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=CompPerformance.htm>
-

CRSI | Comparative Relative Strength Index | DONE

- `list of floats = jhta.CRSI(df1, df2, n, price1='Close', price2='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=RSIC.htm>
-

CS | Comparative Strength | DONE

- `list of floats = jhta.CS(df1, df2, price1='Close', price2='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=CompStrength.htm>
-

Information

INFO | Print df Information | DONE

- `print = jhta.INFO(df, price='Close')`
-

INFO_TRADES | Print Trades Information | DONE

- `print = jhta.INFO_TRADES(profit_trades_list, loss_trades_list)`
-

Math Functions

EXP | Exponential | DONE

- `list of floats = jhta.EXP(df, price='Close')`
-

LOG | Logarithm | DONE

- `list of floats = jhta.LOG(df, price='Close')`
-

LOG10 | Base-10 Logarithm | DONE

- `list of floats = jhta.LOG10(df, price='Close')`
-

SQRT | Square Root | DONE

- `list of floats = jhta.SQRT(df, price='Close')`
-

ACOS | Arc Cosine | DONE

- `list of floats = jhta.ACOS(df, price='Close')`
-

ASIN | Arc Sine | DONE

- `list of floats = jhta.ASIN(df, price='Close')`
-

ATAN | Arc Tangent | DONE

- `list of floats = jhta.ATAN(df, price='Close')`
-

COS | Cosine | DONE

- `list of floats = jhta.COS(df, price='Close')`
-

SIN | Sine | DONE

- `list of floats = jhta.SIN(df, price='Close')`
-

TAN | Tangent | DONE

- list of floats = jhta.TAN(df, price='Close')
-

ACOSH | Inverse Hyperbolic Cosine | DONE

- list of floats = jhta.ACOSH(df, price='Close')
-

ASINH | Inverse Hyperbolic Sine | DONE

- list of floats = jhta.ASINH(df, price='Close')
-

ATANH | Inverse Hyperbolic Tangent | DONE

- list of floats = jhta.ATANH(df, price='Close')
-

COSH | Hyperbolic Cosine | DONE

- list of floats = jhta.COSH(df, price='Close')
-

SINH | Hyperbolic Sine | DONE

- list of floats = jhta.SINH(df, price='Close')
-

TANH | Hyperbolic Tangent | DONE

- list of floats = jhta.TANH(df, price='Close')
-

PI | Mathematical constant PI | DONE

- float = jhta.PI()
-

E | Mathematical constant E | DONE

- `float = jhta.E()`
-

TAU | Mathematical constant TAU | DONE

- `float = jhta.TAU()`
-

PHI | Mathematical constant PHI | DONE

- `float = jhta.PHI()`
-

FIB | Fibonacci series up to n | DONE

- `list of ints = jhta.FIB(n)`
-

CEIL | Ceiling | DONE

- `list of floats = jhta.CEIL(df, price='Close')`
-

FLOOR | Floor | DONE

- `list of floats = jhta.FLOOR(df, price='Close')`
-

DEGREES | Radians to Degrees | DONE

- `list of floats = jhta.DEGREES(df, price='Close')`
-

RADIANS | Degrees to Radians | DONE

- `list of floats = jhta.RADIANS(df, price='Close')`
-

ADD | Addition High + Low | DONE

- list of floats = `jhta.ADD(df, high='High', low='Low')`
-

DIV | Division High / Low | DONE

- list of floats = `jhta.DIV(df, high='High', low='Low')`
-

MAX | Highest value over a specified period | DONE

- list of floats = `jhta.MAX(df, n, price='Close')`
-

MAXINDEX | Index of highest value over a specified period | DONE

- list of ints = `jhta.MAXINDEX(df, n, price='Close')`
-

MIN | Lowest value over a specified period | DONE

- list of floats = `jhta.MIN(df, n, price='Close')`
-

MININDEX | Index of lowest value over a specified period | DONE

- list of ints = `jhta.MININDEX(df, n, price='Close')`
-

MINMAX | Lowest and Highest values over a specified period | DONE

- dict of lists of floats = `jhta.MINMAX(df, n, price='Close')`
-

MINMAXINDEX | Indexes of lowest and highest values over a specified period | DONE

- dict of lists of ints = `jhta.MINMAXINDEX(df, n, price='Close')`
-

MULT | Multiply High * Low | DONE

- list of floats = `jhta.MULT(df, high='High', low='Low')`
-

SUB | Subtraction High - Low | DONE

- list of floats = `jhta.SUB(df, high='High', low='Low')`
-

SUM | Summation | DONE

- list of floats = `jhta.SUM(df, n, price='Close')`
-

SLOPE | Slope | DONE

- float = `jhta.SLOPE(x1, y1, x2, y2)`
 - book: An Introduction to Algorithmic Trading
-

SLOPES | Slopes | DONE

- list of floats = `jhta.SLOPES(df, n, price='Close')`
 - book: An Introduction to Algorithmic Trading
-

ED | Euclidean Distance | DONE

- float = `jhta.ED(x1, y1, x2, y2)`
 - book: An Introduction to Algorithmic Trading
-

EDS | Euclidean Distances | DONE

- list of floats = `jhta.EDS(df, n, price='Close')`
 - book: An Introduction to Algorithmic Trading
-

Momentum Indicators

ADX | Average Directional Movement Index |

-
-

ADXR | Average Directional Movement Index Rating |

-
-

APO | Absolute Price Oscillator | DONE

- list of floats = `jhta.APO(df, n_fast, n_slow, price='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=PriceOscillator.htm>
-

AROON | Aroon |

-
-

AROONOSC | Aroon Oscillator |

-
-

BOP | Balance Of Power |

-
-

CCI | Commodity Channel Index |

-

CMO | Chande Momentum Oscillator |

-

DX | Directional Movement Index |

-

MACD | Moving Average Convergence/Divergence |

-

MACDEXT | MACD with controllable MA type |

-

MACDFIX | Moving Average Convergence/Divergence Fix 12/26 |

-

MFI | Money Flow Index | DONE

- `list of floats = jhta.MFI(df, n, high='High', low='Low', close='Close', volume='Volume')`
- <https://www.fmlabs.com/reference/default.htm?url=MoneyFlowIndex.htm>

MINUS_DI | Minus Directional Indicator |

-

MINUS_DM | Minus Directional Movement |

-

MOM | Momentum | DONE

- `list of floats = jhta.MOM(df, n, price='Close')`
- <https://www.fmlabs.com/reference/default.htm?url=Momentum.htm>

PLUS_DI | Plus Directional Indicator |

-

PLUS_DM | Plus Directional Movement |

-

PPO | Percentage Price Oscillator |

-

RMI | Relative Momentum Index | DONE

- `list of floats = jhta.RMI(df, n, price='Close')`
- <https://www.fmlabs.com/reference/default.htm?url=RMI.htm>

ROC | Rate of Change | DONE

- `list of floats = jhta.ROC(df, n, price='Close')`
-

ROCP | Rate of Change Percentage | DONE

- `list of floats = jhta.ROCP(df, n, price='Close')`
-

ROCR | Rate of Change Ratio | DONE

- `list of floats = jhta.ROCR(df, n, price='Close')`
-

ROCR100 | Rate of Change Ratio 100 scale | DONE

- `list of floats = jhta.ROCR100(df, n, price='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=RateOfChange.htm>
-

RSI | Relative Strength Index | DONE

- `list of floats = jhta.RSI(df, n, price='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=rsi.htm>
-

STOCH | Stochastic | DONE

- `list of floats = jhta.STOCH(df, n, price='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=Stochastic.htm>
-

STOCHF | Stochastic Fast |

-
-

STOCHRSI | Stochastic Relative Strength Index |

-

TRIX | 1-day Rate-Of-Change (ROC) of a Triple Smooth EMA |

-

ULTOSC | Ultimate Oscillator |

-

VHF | Vertical Horizontal Filter | DONE

- `list of floats = jhta.VHF(df, n, price='Close')`
- <https://www.fmlabs.com/reference/default.htm?url=VHF.htm>

WILLR | Williams' %R | DONE

- `list of floats = jhta.WILLR(df, n, high='High', low='Low', close='Close')`
- <https://www.fmlabs.com/reference/default.htm?url=WilliamsR.htm>

Overlap Studies

BBANDS | Bollinger Bands | DONE

- `dict of lists of floats = jhta.BBANDS(df, n, f=2, high='High', low='Low', close='Close')`
- <https://www.fmlabs.com/reference/default.htm?url=Bollinger.htm>

BBANDW | Bollinger Band Width | DONE

- `list of floats = jhta.BBANDW(df, n, f=2, high='High', low='Low', close='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=BollingerWidth.htm>
-

DEMA | Double Exponential Moving Average |

-
-

EMA | Exponential Moving Average | DONE

- `list of floats = jhta.EMA(df, n, price='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=ExpMA.htm>
-

ENVP | Envelope Percent | DONE

- `dict of lists of floats = jhta.ENVP(df, pct=.01, price='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=EnvelopePct.htm>
-

KAMA | Kaufman Adaptive Moving Average |

-
-

MA | Moving Average |

-
-

MAMA | MESA Adaptive Moving Average |

-
-

MAVP | Moving Average with Variable Period |

-
-

MIDPOINT | MidPoint over period | DONE

- `list of floats = jhta.MIDPOINT(df, n, price='Close')`
 - <http://www.tadoc.org/indicator/MIDPOINT.htm>
-

MIDPRICE | MidPoint Price over period | DONE

- `list of floats = jhta.MIDPRICE(df, n, high='High', low='Low')`
 - <http://www.tadoc.org/indicator/MIDPRICE.htm>
-

MMR | Mayer Multiple Ratio | DONE

- `list of floats = jhta.MMR(df, n=200, price='Close')`
 - <https://www.theinvestorspodcast.com/bitcoin-mayer-multiple/>
-

SAR | Parabolic SAR | DONE

- `list of floats = jhta.SAR(df, af_step=.02, af_max=.2, high='High', low='Low')`
 - book: New Concepts in Technical Trading Systems
-

SAREXT | Parabolic SAR - Extended |

-
-

SMA | Simple Moving Average | DONE

- `list of floats = jhta.SMA(df, n, price='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=SimpleMA.htm>
-

T3 | Triple Exponential Moving Average (T3) |

-
-

TEMA | Triple Exponential Moving Average |

-
-

TRIMA | Triangular Moving Average | DONE

- `list of floats = jhta.TRIMA(df, n, price='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=TriangularMA.htm>
-

VAMA | Volume Adjusted Moving Average | DONE

- `list of floats = jhta.VAMA(df, n, price='Close', volume='Volume')`
 - <https://www.fmlabs.com/reference/default.htm?url=VolAdjustedMA.htm>
-

WMA | Weighted Moving Average

-
-

WWMA | Welles Wilder Moving Average | DONE

- `list of floats = jhta.WWMA(df, n, price='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=WellesMA.htm>
-

WWS | Welles Wilder Summation | DONE

- `list of floats = jhta.WWS(df, n, price='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=WellesSum.htm>
-

Pattern Recognition

CDL2CROWS | Two Crows |

CDL3BLACKCROWS | Three Black Crows |

CDL3INSIDE | Three Inside Up/Down |

CDL3LINESTRIKE | Three-Line Strike |

CDL3OUTSIDE | Three Outside Up/Down |

CDL3STARSINSOUTH | Three Stars In The South |

CDL3WHITESOLDIERS | Three Advancing White Soldiers |

CDLABANDONEDBABY | Abandoned Baby |

CDLADVANCEBLOCK | Advance Block |

CDLBELTHOLD | Belt-hold |

CDLBREAKAWAY | Breakaway |

CDLCLOSINGMARUBOZU | Closing Marubozu |

CDLCONSEALBABYSWALL | Concealing Baby Swallow |

CDLCOUNTERATTACK | Counterattack |

CDLDARKCLOUDCOVER | Dark Cloud Cover |

CDLDOJI | Doji |

CDLDOJISTAR | Doji Star |

CDLDRAGONFLYDOJI | Dragonfly Doji |

CDLENGULFING | Engulfing Pattern |

CDLEVENINGDOJISTAR | Evening Doji Star |

CDLEVENINGSTAR | Evening Star |

CDLGAPSIDESIDEWHITE | Up/Down-gap side-by-side white lines
|

CDLGRAVESTONEDOJI | Gravestone Doji |

CDLHAMMER | Hammer |

CDLHANGINGMAN | Hanging Man |

CDLHARAMI | Harami Pattern |

CDLHARAMICROSS | Harami Cross Pattern |

CDLHIGHWAVE | High-Wave Candle |

CDLHIKKAKE | Hikkake Pattern |

CDLHIKKAKEMOD | Modified Hikkake Pattern |

CDLHOMINGPIGEON | Homing Pigeon |

CDLIDENTICAL3CROWS | Identical Three Crows |

CDLINNECK | In-Neck Pattern |

CDLINVERTEDHAMMER | Inverted Hammer |

CDLKICKING | Kicking |

CDLKICKINGBYLENGTH | Kicking - bull/bear determined by the longer marubozu |

CDLLADDERBOTTOM | Ladder Bottom |

CDLLONGLEGGEDDOJI | Long Legged Doji |

CDLLONGLINE | Long Line Candle |

CDLMARUBOZU | Marubozu |

CDLMATCHINGLOW | Matching Low |

CDLMATHOLD | Mat Hold |

CDLMORNINGDOJISTAR | Morning Doji Star |

CDLMORNINGSTAR | Morning Star |

CDLONNECK | On-Neck Pattern |

CDLPIERCING | Piercing Pattern |

CDLRICKSHAWMAN | Rickshaw Man |

CDLRISEFALL3METHODS | Rising/Falling Three Methods |

CDLSEPARATINGLINES | Separating Lines |

CDLSHOOTINGSTAR | Shooting Star |

CDLSHORTLINE | Short Line Candle |

CDLSPINNINGTOP | Spinning Top |

CDLSTALLEDPATTERN | Stalled Pattern |

CDLTICKSANDWICH | Stick Sandwich |

CDLTAKURI | Takuri (Dragonfly Doji with very long lower shadow)
|

CDLTASUKIGAP | Tasuki Gap |

CDLTHRUSTING | Thrusting Pattern |

CDLTRISTAR | Tristar Pattern |

CDLUNIQUE3RIVER | Unique 3 River |

CDLUPSIDEGAP2CROWS | Upside Gap Two Crows |

CDLXSIDEGAP3METHODS | Upside/Downside Gap Three Methods |

Price Transform

AVGPRICE | Average Price | **DONE**

- list of floats = `jhta.AVGPRICE(df, open='Open', high='High', low='Low', close='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=AvgPrices.htm>
-

MEDPRICE | Median Price | DONE

- `list of floats = jhta.MEDPRICE(df, high='High', low='Low')`
 - <https://www.fmlabs.com/reference/default.htm?url=MedianPrices.htm>
-

TYPPRICE | Typical Price | DONE

- `list of floats = jhta.TYPPRICE(df, high='High', low='Low', close='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=TypicalPrices.htm>
-

WCLPRICE | Weighted Close Price | DONE

- `list of floats = jhta.WCLPRICE(df, high='High', low='Low', close='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=WeightedCloses.htm>
-

Statistic Functions

MEAN | Arithmetic mean (average) of data | DONE

- `list of floats = jhta.MEAN(df, n, price='Close')`
-

HARMONIC_MEAN | Harmonic mean of data | DONE

- `list of floats = jhta.HARMONIC_MEAN(df, n, price='Close')`
-

MEDIAN | Median (middle value) of data | DONE

- `list of floats = jhta.MEDIAN(df, n, price='Close')`
-

MEDIAN_LOW | Low median of data | DONE

- `list of floats = jhta.MEDIAN_LOW(df, n, price='Close')`
-

MEDIAN_HIGH | High median of data | DONE

- `list of floats = jhta.MEDIAN_HIGH(df, n, price='Close')`
-

MEDIAN_GROUPED | Median, or 50th percentile, of grouped data | DONE

- `list of floats = jhta.MEDIAN_GROUPED(df, n, price='Close', interval=1)`
-

MODE | Mode (most common value) of discrete data | DONE

- `list of floats = jhta.MODE(df, n, price='Close')`
-

PSTDEV | Population standard deviation of data | DONE

- `list of floats = jhta.PSTDEV(df, n, price='Close', mu=None)`
-

PVARIANCE | Population variance of data | DONE

- `list of floats = jhta.PVARIANCE(df, n, price='Close', mu=None)`
-

STDEV | Sample standard deviation of data | DONE

- `list of floats = jhta.STDEV(df, n, price='Close', xbar=None)`
-

VARIANCE | Sample variance of data | DONE

- `list of floats = jhta.VARIANCE(df, n, price='Close', xbar=None)`
-

COV | Covariance | DONE

- `float = jhta.COV(x_list, y_list)`
 - https://en.wikipedia.org/wiki/Algorithms_for_calculating_variance#Covariance
-

COVARIANCE | Covariance | DONE

- `list of floats = jhta.COVARANCE(df1, df2, n, price1='Close', price2='Close')`
 - https://en.wikipedia.org/wiki/Algorithms_for_calculating_variance#Covariance
-

COR | Correlation | DONE

- `float = jhta.COR(x_list, y_list)`
-

CORRELATION | Correlation | DONE

- `list of floats = jhta.CORRELATION(df1, df2, n, price1='Close', price2='Close')`
-

PCOR | Population Correlation | DONE

- `float = jhta.PCOR(x_list, y_list)`
-

PCORRELATION | Population Correlation | DONE

- `list of floats = jhta.PCORRELATION(df1, df2, n, price1='Close', price2='Close')`
-

R2 | R-Squared | DONE

- `float = jhta.R2(x_list, y_list)`
 - <https://www.wallstreetmojo.com/r-squared-formula/>
-

RSQUARED | R-Squared | DONE

- `list of floats = jhta.RSQUARED(df1, df2, n, price1='Close', price2='Close')`
 - <https://www.wallstreetmojo.com/r-squared-formula/>
-

REGRESSION | Regression | DONE

- `dict of lists of floats = jhta.REGRESSION(x_list, y_list)`
 - <https://www.wallstreetmojo.com/regression-formula/>
-

SSE | Sum of the Squared Errors | DONE

- `float = jhta.SSE(x_list, y_list)`
 - <https://www.wikihow.com/Calculate-the-Standard-Error-of-Estimate>
-

SEE | Standard Error of Estimate | DONE

- `float = jhta.SEE(x_list, y_list)`
 - <https://www.wikihow.com/Calculate-the-Standard-Error-of-Estimate>
-

PSEE | Population Standard Error of Estimate | DONE

- `float = jhta.PSEE(x_list, y_list)`
 - <https://www.wikihow.com/Calculate-the-Standard-Error-of-Estimate>
-

LSMA | Least Squares Moving Average | DONE

- `list of floats = jhta.LSMA(df, n, price='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=LstSqrMA.htm>
-

BETA | Beta | DONE

- `float = jhta.BETA(x_list, y_list)`
 - [https://en.wikipedia.org/wiki/Beta_\(finance\)](https://en.wikipedia.org/wiki/Beta_(finance))
-

BETAS | Betas | DONE

- `list of floats = jhta.BETAS(df1, df2, n, price1='Close', price2='Close')`
 - [https://en.wikipedia.org/wiki/Beta_\(finance\)](https://en.wikipedia.org/wiki/Beta_(finance))
-

LSR | Least Squares Regression | DONE

- `list of floats = jhta.LSR(df, price='Close', predictions_int=0)`
 - <https://www.mathsisfun.com/data/least-squares-regression.html>
-

SLR | Simple Linear Regression | DONE

- `list of floats = jhta.SLR(df, price='Close', predictions_int=0)`
 - <https://machinelearningmastery.com/implement-simple-linear-regression-scratch-python/>
-

Uncategorised

HR | Hit Rate / Win Rate | DONE

- `float = jhta.HR(hit_trades_int, total_trades_int)`
 - <http://traderskillset.com/hit-rate-stock-trading/>
-

PLR | Profit/Loss Ratio | DONE

- `float = jhta.PLR(mean_trade_profit_float, mean_trade_loss_float)`
 - https://www.investopedia.com/terms/p/profit_loss_ratio.asp
-

EV | Expected Value | DONE

- `float = jhta.EV(hittrade_float, mean_trade_profit_float, mean_trade_loss_float)`
 - https://en.wikipedia.org/wiki/Expected_value
-

POR | Probability of Ruin (Table of Lucas and LeBeau) | DONE

- `int = jhta.POR(hittrade_float, profit_loss_ratio_float)`
 - book: Computer Analysis of the Futures Markets
-

BPPS | Basis Points per Second | DONE

- `float = jhta.BPPS(trade_start_price, trade_end_price, trade_start_timestamp, trade_end_timestamp)`
 - book: An Introduction to Algorithmic Trading
-

RET | Return | DONE

- `list of floats = jhta.RET(df, price='Close')`
 - book: An Introduction to Algorithmic Trading
-

RETS | Returns | DONE

- `list of floats = jhta.RETS(df, price='Close')`
 - book: An Introduction to Algorithmic Trading
-

PRET | %Return | DONE

- `list of floats = jhta.PRET(df, price='Close')`
 - book: An Introduction to Algorithmic Trading
-

PRETS | %Returns | DONE

- `list of floats = jhta.PRETS(df, price='Close')`
 - book: An Introduction to Algorithmic Trading
-

Volatility Indicators

AEM | Arms Ease of Movement | DONE

- `list of floats = jhta.AEM(df, high='High', low='Low', volume='Volume')`
 - <https://www.fmlabs.com/reference/default.htm?url=ArmsEMV.htm>
-

ATR | Average True Range | DONE

- `list of floats = jhta.ATR(df, n, high='High', low='Low', close='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=ATR.htm>
-

NATR | Normalized Average True Range |

-
-

RVI | Relative Volatility Index | DONE

- `list of floats = jhta.RVI(df, n, high='High', low='Low')`
 - <https://www.fmlabs.com/reference/default.htm?url=RVI.htm>
-

RVIOC | Relative Volatility Index Original Calculation | DONE

- `list of floats = jhta.RVIOC(df, n, price='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=RVIOoriginal.htm>
-

INERTIA | Inertia | DONE

- `list of floats = jhta.INERTIA(df, n, price='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=Inertia.htm>
-

PRANGE | %Range | DONE

- `list of floats = jhta.PRANGE(df, n, max_price='High', min_price='Low')`
 - book: An Introduction to Algorithmic Trading
-

TRANGE | True Range | DONE

- `list of floats = jhta.TRANGE(df, high='High', low='Low', close='Close')`
 - <https://www.fmlabs.com/reference/default.htm?url=TR.htm>
-

DVOLA | Daily Volatility | DONE

- `list of floats = jhta.DVOLA(df, n=30, price='Close')`
 - <https://www.wallstreetmojo.com/volatility-formula/>
-

AVOLA | Annual Volatility | DONE

- `list of floats = jhta.AVOLA(df, n=30, na=252, price='Close')`
 - <https://www.wallstreetmojo.com/volatility-formula/>
-

Volume Indicators

AD | Chaikin A/D Line | DONE

- `list of floats = jhta.AD(df, high='High', low='Low', close='Close', volume='Volume')`
 - <https://www.fmlabs.com/reference/default.htm?url=AccumDist.htm>
-

ADOSC | Chaikin A/D Oscillator |

-
-

MFAI | Market Facilitation Index | DONE

- `list of floats = jhta.MFAI(df, high='High', low='Low', volume='Volume')`
 - <https://www.fmlabs.com/reference/default.htm?url=MFI.htm>
-

NVI | Negative Volume Index | DONE

- `list of floats = jhta.NVI(df, price='Close', volume='Volume')`
 - <https://www.fmlabs.com/reference/default.htm?url=NVI.htm>
-

OBV | On Balance Volume | DONE

- `list of floats = jhta.OBV(df, close='Close', volume='Volume')`
 - <https://www.fmlabs.com/reference/default.htm?url=OBV.htm>
-

PVR | Price Volume Rank | DONE

- `list of ints = jhta.PVR(df, price='Close', volume='Volume')`
 - <https://www.fmlabs.com/reference/default.htm?url=PVrank.htm>
-

PVT | Price Volume Trend | DONE

- `list of floats = jhta.PVT(df, price='Close', volume='Volume')`
 - <https://www.fmlabs.com/reference/default.htm?url=PVT.htm>
-

PVI | Positive Volume Index | DONE

- `list of floats = jhta.PVI(df, price='Close', volume='Volume')`
 - <https://www.fmlabs.com/reference/default.htm?url=PVI.htm>
-

VWAP | Volume Weighted Average Price | DONE

- `list of floats = jhta.VWAP(df, open='Open', high='High', low='Low', close='Close', volume='Volume')`
 - book: An Introduction to Algorithmic Trading
-

Notebooks

- <https://github.com/joosthoeks/jhTALib/tree/master/notebook>

Dollar Cost Averaging Discount DCAD

- https://colab.research.google.com/github/joosthoeks/jhTALib/blob/master/notebook/dollar_cost_averaging_discount_dcad.ipynb
-

Recession Probability

- https://colab.research.google.com/github/joosthoeks/jhTALib/blob/master/notebook/recession_probability.ipynb
-

Donation and Funding

- BTC: 3KCoXMyUDgVABoFSuV8GQT3k8qkUhEDG9X
-