

Python 3.8.5 (default, Sep 3 2020, 21:29:08) [MSC v.1916 64 bit (AMD64)]

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IPython 7.19.0 -- An enhanced Interactive Python. Type '?' for help.

```
In [ ]: import ta_orig
import __wps_pandas.ta as ta
import __wps_pandas.rate as rate

import sp500

import pandas as pd
import numpy as np

from tqdm import tqdm

NAME = "stocks_norgate.pkl"
STOCKS = pd.read_pickle(NAME)
```

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In [ ]: import ta_orig
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import sp500

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import numpy as np

from tqdm import tqdm

NAME = "stocks_norgate.pkl"
STOCKS = pd.read_pickle(NAME)
```

```
In [ ]: #
# MACD
#
NAME = "stocks_norgate.pkl"
STOCKS = pd.read_pickle(NAME)
for symbol in sp500.stocks.symbols()[:]:

    bars = STOCKS[ STOCKS.Symbol == symbol ].tail(200)
    if len(bars) != 200: continue

    new_bars_macd = ta.macd(bars)
    new_bars_macd['MACD_Rating'] = bars.apply(lambda x: rate.macd(x['MACD'], x['signal_'])

    new_output = (
        new_bars_macd['MACD_Rating'].tail(1)[0],
        new_bars_macd['MACD_Slope'].tail(1)[0]
    )

    old_output = ta_orig.MACD_rating(bars)

    if (new_output == old_output):
        print('\u2713' + f' {symbol} [MACD]')
    else:
        print('\u274c' + f' {symbol} [MACD]')
        raise Exception("Not Equivalent")
```

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```
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# SMA  
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STOCKS = pd.read_pickle(NAME)  
for symbol in sp500.stocks.symbols()[:]:  
  
    bars = STOCKS[ STOCKS.Symbol == symbol ].tail(200)  
    if len(bars) != 200: continue
```

```
new_output = ta.sma(bars)
new_output = ta.rate_sma(bars)[ 'SMA_Rating' ].tail(1)[0]
old_output = ta_orig.SMA_rating(bars)

if (new_output == old_output):
    print('\u2713' + f' {symbol} [SMA]')
else:
    print('\u274c' + f' {symbol} [SMA]')
    raise Exception("Not Equivalent")
```

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✓ ZTS [SMA]

```
In [ ]: #
# RSI
#
import ta_orig
import __wps_pandas.ta as ta
import __wps_pandas.rate as rate

NAME = "stocks_norgate.pkl"
STOCKS = pd.read_pickle(NAME)

for symbol in sp500.stocks.symbols()[:]:
```

```
    bars = STOCKS[ STOCKS.Symbol == symbol ].tail(200)
    if len(bars) != 200: continue

    new_output = ta.rsi_old(bars)
    new_output = ta.rate_rsi(bars)[ 'RSI_Rating' ].tail(1)[0]
    old_output = ta_orig.daily_rsi_values(symbol, bars)

    if (new_output == old_output):
        print('\u2713' + f' {symbol} [RSI]')
    else:
        print('\u274c' + f' {symbol} [RSI]')
        raise Exception("Not Equivalent")
```

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✓ AOS [RSI]
✓ ABT [RSI]
✓ ABBV [RSI]
✓ ABMD [RSI]
✓ ACN [RSI]
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- ✓ ZTS [RSI]

In []:

```

# 
# PnF
#
import ta_orig
import __wps_pandas.ta as ta
import __wps_pandas.rate as rate

NAME = "stocks_norgate.pkl"
STOCKS = pd.read_pickle(NAME)

for symbol in sp500.stocks.symbols()[:]: 

    bars = STOCKS[ STOCKS.Symbol == symbol ].tail(200)
    if len(bars) != 200: continue

    bars = ta.rate_pnf(bars)
    new_output = bars['PNF_Rating'].tail(1)[0]
    old_output = ta_orig.PnFMain(bars)

    if (new_output == old_output):
        print('\u2713' + f'{symbol} [PnF]')
    else:
        if ( np.isnan(new_output) and np.isnan(old_output) ):
            print('\u2713' + f'{symbol} [PnF]')
        continue

    print('\u274c' + f'{symbol} [PnF]')
    raise Exception("Not Equivalent")

```

- ✓ MMM [PnF]
- ✓ AOS [PnF]
- ✓ ABT [PnF]
- ✓ ABBV [PnF]
- ✓ ABMD [PnF]
- ✓ ACN [PnF]
- ✓ ATVI [PnF]
- ✓ ADM [PnF]
- ✓ ADBE [PnF]
- ✓ ADP [PnF]
- ✓ AAP [PnF]
- ✓ AES [PnF]
- ✓ AFL [PnF]
- ✓ A [PnF]
- ✓ APD [PnF]
- ✓ AKAM [PnF]

✓ ALK [PnF]
✓ ALB [PnF]
✓ ARE [PnF]
✓ ALGN [PnF]
✓ ALLE [PnF]
✓ LNT [PnF]
✓ ALL [PnF]
✓ GOOGL [PnF]
✓ GOOG [PnF]
✓ MO [PnF]
✓ AMZN [PnF]
✓ AMCR [PnF]
✓ AMD [PnF]
✓ AEE [PnF]
✓ AAL [PnF]
✓ AEP [PnF]
✓ AXP [PnF]
✓ AIG [PnF]
✓ AMT [PnF]
✓ AWK [PnF]
✓ AMP [PnF]
✓ ABC [PnF]
✓ AME [PnF]
✓ AMGN [PnF]
✓ APH [PnF]
✓ ADI [PnF]
✓ ANSS [PnF]
✓ AON [PnF]
✓ APA [PnF]
✓ AAPL [PnF]
✓ AMAT [PnF]
✓ APTV [PnF]
✓ ACGL [PnF]
✓ ANET [PnF]
✓ AJG [PnF]
✓ AIZ [PnF]
✓ T [PnF]
✓ ATO [PnF]
✓ ADSK [PnF]
✓ AZO [PnF]
✓ AVB [PnF]
✓ AVY [PnF]
✓ BKR [PnF]
✓ BALL [PnF]
✓ BAC [PnF]
✓ BBWI [PnF]
✓ BAX [PnF]
✓ BDX [PnF]
✓ WRB [PnF]
✓ BRK.B [PnF]
✓ BBY [PnF]
✓ BIO [PnF]
✓ TECH [PnF]
✓ BIIB [PnF]
✓ BLK [PnF]
✓ BK [PnF]
✓ BA [PnF]

✓ BKNG [PnF]
✓ BWA [PnF]
✓ BXP [PnF]
✓ BSX [PnF]
✓ BMY [PnF]
✓ AVG0 [PnF]
✓ BR [PnF]
✓ BRO [PnF]
✓ BF.B [PnF]
✓ CHRW [PnF]
✓ CDNS [PnF]
✓ CZR [PnF]
✓ CPT [PnF]
✓ CPB [PnF]
✓ COF [PnF]
✓ CAH [PnF]
✓ KMX [PnF]
✓ CCL [PnF]
✓ CARR [PnF]
✓ CTLT [PnF]
✓ CAT [PnF]
✓ CBOE [PnF]
✓ CBRE [PnF]
✓ CDW [PnF]
✓ CE [PnF]
✓ CNC [PnF]
✓ CNP [PnF]
✓ CDAY [PnF]
✓ CF [PnF]
✓ CRL [PnF]
✓ SCHW [PnF]
✓ CHTR [PnF]
✓ CVX [PnF]
✓ CMG [PnF]
✓ CB [PnF]
✓ CHD [PnF]
✓ CI [PnF]
✓ CINF [PnF]
✓ CTAS [PnF]
✓ CSCO [PnF]
✓ C [PnF]
✓ CFG [PnF]
✓ CLX [PnF]
✓ CME [PnF]
✓ CMS [PnF]
✓ KO [PnF]
✓ CTSH [PnF]
✓ CL [PnF]
✓ CMCSA [PnF]
✓ CMA [PnF]
✓ CAG [PnF]
✓ COP [PnF]
✓ ED [PnF]
✓ STZ [PnF]
✓ CEG [PnF]
✓ COO [PnF]
✓ CPRT [PnF]

✓ GLW [PnF]
✓ CTVA [PnF]
✓ CSGP [PnF]
✓ COST [PnF]
✓ CTRA [PnF]
✓ CCI [PnF]
✓ CSX [PnF]
✓ CMI [PnF]
✓ CVS [PnF]
✓ DHI [PnF]
✓ DHR [PnF]
✓ DRI [PnF]
✓ DVA [PnF]
✓ DE [PnF]
✓ DAL [PnF]
✓ XRAY [PnF]
✓ DVN [PnF]
✓ DXCM [PnF]
✓ FANG [PnF]
✓ DLR [PnF]
✓ DFS [PnF]
✓ DISH [PnF]
✓ DIS [PnF]
✓ DG [PnF]
✓ DLTR [PnF]
✓ D [PnF]
✓ DPZ [PnF]
✓ DOV [PnF]
✓ DOW [PnF]
✓ DTE [PnF]
✓ DUK [PnF]
✓ DD [PnF]
✓ DXC [PnF]
✓ EMN [PnF]
✓ ETN [PnF]
✓ EBAY [PnF]
✓ ECL [PnF]
✓ EIX [PnF]
✓ EW [PnF]
✓ EA [PnF]
✓ ELV [PnF]
✓ LLY [PnF]
✓ EMR [PnF]
✓ ENPH [PnF]
✓ ETR [PnF]
✓ EOG [PnF]
✓ EPAM [PnF]
✓ EQT [PnF]
✓ EFX [PnF]
✓ EQIX [PnF]
✓ EQR [PnF]
✓ ESS [PnF]
✓ EL [PnF]
✓ ETSY [PnF]
✓ RE [PnF]
✓ EVRG [PnF]
✓ ES [PnF]

✓ EXC [PnF]
✓ EXPE [PnF]
✓ EXPD [PnF]
✓ EXR [PnF]
✓ XOM [PnF]
✓ FFIIV [PnF]
✓ FDS [PnF]
✓ FAST [PnF]
✓ FRT [PnF]
✓ FDX [PnF]
✓ FITB [PnF]
✓ FRC [PnF]
✓ FE [PnF]
✓ FIS [PnF]
✓ FISV [PnF]
✓ FLT [PnF]
✓ FMC [PnF]
✓ F [PnF]
✓ FTNT [PnF]
✓ FTV [PnF]
✓ FBHS [PnF]
✓ FOXA [PnF]
✓ FOX [PnF]
✓ BEN [PnF]
✓ FCX [PnF]
✓ GRMN [PnF]
✓ IT [PnF]
✓ GNRC [PnF]
✓ GD [PnF]
✓ GE [PnF]
✓ GIS [PnF]
✓ GM [PnF]
✓ GPC [PnF]
✓ GILD [PnF]
✓ GL [PnF]
✓ GPN [PnF]
✓ GS [PnF]
✓ HAL [PnF]
✓ HIG [PnF]
✓ HAS [PnF]
✓ HCA [PnF]
✓ PEAK [PnF]
✓ HSIC [PnF]
✓ HSY [PnF]
✓ HES [PnF]
✓ HPE [PnF]
✓ HLT [PnF]
✓ HOLX [PnF]
✓ HD [PnF]
✓ HON [PnF]
✓ HRL [PnF]
✓ HST [PnF]
✓ HWM [PnF]
✓ HPQ [PnF]
✓ HUM [PnF]
✓ HBAN [PnF]
✓ HII [PnF]

✓ IBM [PnF]
✓ IEX [PnF]
✓ IDXX [PnF]
✓ ITW [PnF]
✓ ILMN [PnF]
✓ INCY [PnF]
✓ IR [PnF]
✓ INTC [PnF]
✓ ICE [PnF]
✓ IP [PnF]
✓ IPG [PnF]
✓ IFF [PnF]
✓ INTU [PnF]
✓ ISRG [PnF]
✓ IVZ [PnF]
✓ INVH [PnF]
✓ IQV [PnF]
✓ IRM [PnF]
✓ JBHT [PnF]
✓ JKHY [PnF]
✓ J [PnF]
✓ JNJ [PnF]
✓ JCI [PnF]
✓ JPM [PnF]
✓ JNPR [PnF]
✓ K [PnF]
✓ KDP [PnF]
✓ KEY [PnF]
✓ KEYS [PnF]
✓ KMB [PnF]
✓ KIM [PnF]
✓ KMI [PnF]
✓ KLAC [PnF]
✓ KHC [PnF]
✓ KR [PnF]
✓ LHX [PnF]
✓ LH [PnF]
✓ LRCX [PnF]
✓ LW [PnF]
✓ LVS [PnF]
✓ LDOS [PnF]
✓ LEN [PnF]
✓ LNC [PnF]
✓ LIN [PnF]
✓ LYV [PnF]
✓ LKQ [PnF]
✓ LMT [PnF]
✓ L [PnF]
✓ LOW [PnF]
✓ LUMN [PnF]
✓ LYB [PnF]
✓ MTB [PnF]
✓ MRO [PnF]
✓ MPC [PnF]
✓ MKTX [PnF]
✓ MAR [PnF]
✓ MMC [PnF]

✓ MLM [PnF]
✓ MAS [PnF]
✓ MA [PnF]
✓ MTCH [PnF]
✓ MKC [PnF]
✓ MCD [PnF]
✓ MCK [PnF]
✓ MDT [PnF]
✓ MRK [PnF]
✓ META [PnF]
✓ MET [PnF]
✓ MTD [PnF]
✓ MGM [PnF]
✓ MCHP [PnF]
✓ MU [PnF]
✓ MSFT [PnF]
✓ MAA [PnF]
✓ mRNA [PnF]
✓ MHK [PnF]
✓ MOH [PnF]
✓ TAP [PnF]
✓ MDLZ [PnF]
✓ MPWR [PnF]
✓ MNST [PnF]
✓ MCO [PnF]
✓ MS [PnF]
✓ MOS [PnF]
✓ MSI [PnF]
✓ MSCI [PnF]
✓ NDAQ [PnF]
✓ NTAP [PnF]
✓ NFLX [PnF]
✓ NWL [PnF]
✓ NEM [PnF]
✓ NWSA [PnF]
✓ NWS [PnF]
✓ NEE [PnF]
✓ NKE [PnF]
✓ NI [PnF]
✓ NDSN [PnF]
✓ NSC [PnF]
✓ NTRS [PnF]
✓ NOC [PnF]
✓ NLOK [PnF]
✓ NCLH [PnF]
✓ NRG [PnF]
✓ NUE [PnF]
✓ NVDA [PnF]
✓ NVR [PnF]
✓ NXPI [PnF]
✓ ORLY [PnF]
✓ OXY [PnF]
✓ ODFL [PnF]
✓ OMC [PnF]
✓ ON [PnF]
✓ OKE [PnF]
✓ ORCL [PnF]

✓ OGN [PnF]
✓ OTIS [PnF]
✓ PCAR [PnF]
✓ PKG [PnF]
✓ PARA [PnF]
✓ PH [PnF]
✓ PAYX [PnF]
✓ PAYC [PnF]
✓ PYPL [PnF]
✓ PNR [PnF]
✓ PEP [PnF]
✓ PKI [PnF]
✓ PFE [PnF]
✓ PCG [PnF]
✓ PM [PnF]
✓ PSX [PnF]
✓ PNW [PnF]
✓ PXD [PnF]
✓ PNC [PnF]
✓ POOL [PnF]
✓ PPG [PnF]
✓ PPL [PnF]
✓ PFG [PnF]
✓ PG [PnF]
✓ PGR [PnF]
✓ PLD [PnF]
✓ PRU [PnF]
✓ PEG [PnF]
✓ PTC [PnF]
✓ PSA [PnF]
✓ PHM [PnF]
✓ QRVO [PnF]
✓ PWR [PnF]
✓ QCOM [PnF]
✓ DGX [PnF]
✓ RL [PnF]
✓ RJF [PnF]
✓ RTX [PnF]
✓ O [PnF]
✓ REG [PnF]
✓ REGN [PnF]
✓ RF [PnF]
✓ RSG [PnF]
✓ RMD [PnF]
✓ RHI [PnF]
✓ ROK [PnF]
✓ ROL [PnF]
✓ ROP [PnF]
✓ ROST [PnF]
✓ RCL [PnF]
✓ SPGI [PnF]
✓ CRM [PnF]
✓ SBAC [PnF]
✓ SLB [PnF]
✓ STX [PnF]
✓ SEE [PnF]
✓ SRE [PnF]

✓ NOW [PnF]
✓ SHW [PnF]
✓ SBNY [PnF]
✓ SPG [PnF]
✓ SWKS [PnF]
✓ SJM [PnF]
✓ SNA [PnF]
✓ SEDG [PnF]
✓ SO [PnF]
✓ LUV [PnF]
✓ SWK [PnF]
✓ SBUX [PnF]
✓ STT [PnF]
✓ STE [PnF]
✓ SYK [PnF]
✓ SIVB [PnF]
✓ SYF [PnF]
✓ SNPS [PnF]
✓ SYY [PnF]
✓ TMUS [PnF]
✓ TROW [PnF]
✓ TTWO [PnF]
✓ TPR [PnF]
✓ TRGP [PnF]
✓ TGT [PnF]
✓ TEL [PnF]
✓ TDY [PnF]
✓ TFX [PnF]
✓ TER [PnF]
✓ TSLA [PnF]
✓ TXN [PnF]
✓ TXT [PnF]
✓ TMO [PnF]
✓ TJX [PnF]
✓ TSCO [PnF]
✓ TT [PnF]
✓ TDG [PnF]
✓ TRV [PnF]
✓ TRMB [PnF]
✓ TFC [PnF]
✓ TYL [PnF]
✓ TSN [PnF]
✓ USB [PnF]
✓ UDR [PnF]
✓ ULTA [PnF]
✓ UNP [PnF]
✓ UAL [PnF]
✓ UPS [PnF]
✓ URI [PnF]
✓ UNH [PnF]
✓ UHS [PnF]
✓ VLO [PnF]
✓ VTR [PnF]
✓ VRSN [PnF]
✓ VRSK [PnF]
✓ VZ [PnF]
✓ VRTX [PnF]

✓ VFC [PnF]
✓ VTRS [PnF]
✓ VICI [PnF]
✓ V [PnF]
✓ VNO [PnF]
✓ VMC [PnF]
✓ WAB [PnF]
✓ WBA [PnF]
✓ WMT [PnF]
✓ WBD [PnF]
✓ WM [PnF]
✓ WAT [PnF]
✓ WEC [PnF]
✓ WFC [PnF]
✓ WELL [PnF]
✓ WST [PnF]
✓ WDC [PnF]
✓ WRK [PnF]
✓ WY [PnF]
✓ WHR [PnF]
✓ WMB [PnF]
✓ WTW [PnF]
✓ GWW [PnF]
✓ WYNN [PnF]
✓ XEL [PnF]
✓ XYL [PnF]
✓ YUM [PnF]
✓ ZBRA [PnF]
✓ ZBH [PnF]
✓ ZION [PnF]
✓ ZTS [PnF]

```
In [ ]: #  

# Stock Recommendations  

#  

NAME    = "stocks_norgate.pkl"  

STOCKS = pd.read_pickle(NAME)  

  

valid = pd.DataFrame()  

for symbol in tqdm(sp500.stocks.symbols()[:], desc = "[+] testing annotations"):  

  

    bars = STOCKS[ STOCKS.Symbol == symbol ].tail(200)  

    if len(bars) != 200: continue  

  

    bars = ta.macd(bars)  

    bars['MACD_Rating'] = bars.apply(lambda x: rate.macd(x['MACD'], x['signal_line']),  

    MACD_Rating = bars['MACD_Rating'].tail(1)[0]  

    MACD_Slope  = bars['MACD_Slope'].tail(1)[0]  

  

    bars = ta.sma(bars)  

    SMA_Rating = ta.rate_sma(bars)['SMA_Rating'].tail(1)[0]  

  

    bars = ta.rsi_old(bars)  

    RSI_Rating = ta.rate_rsi(bars)['RSI_Rating'].tail(1)[0]  

  

    if MACD_Rating == 1 \  

        and MACD_Slope == 1 \  

        and SMA_Rating == 1 \  


```

```
and RSI_Rating == 1:  
    valid = pd.concat([valid, bars.tail(1)])  
  
GOLD_OUTPUT = [  
    'AMP', 'AJG', 'WRB', 'CBOE', 'NDAQ', 'COP', 'MRO', 'MPC', 'OXY', 'FTV', 'IEX', 'PWR', 'SNA', 'GW'  
]  
  
if set(GOLD_OUTPUT).issubset(set(valid['Symbol'])):  
    print('\u2713' + f' {len(GOLD_OUTPUT)} match | {len(valid) - len(GOLD_OUTPUT)} unique')  
else:  
    print('\u274c' + f' {len(valid) - len(GOLD_OUTPUT)} missing...')
```

[+] tesing annotations: 100%|██████████| 503/503 [00:16<00:00, 30.44it/s]
✓ 21 match | 13 unique