

虛擬貨幣技術指標 python 版

參考 Doc [http://mrjbq7.github.io/ta-lib/doc\\_index.html](http://mrjbq7.github.io/ta-lib/doc_index.html)

Input: a series without title

MA\_Type: 0=SMA, 1=EMA, 2=WMA, 3=DEMA, 4=TEMA, 5=TRIMA, 6=KAMA, 7=MAMA,  
8=T3 (Default=SMA)

## 1. 移動平均線

### 甲、MA

- i. Group: Overlap Studies Functions
- ii. Function: `real = SMA(close, timeperiod=5)`

### 乙、EMA

- i. Group: Overlap Studies Functions
- ii. Function: `real = EMA(close, timeperiod=5)`

### 丙、WMA

- i. Group: Overlap Studies Functions
- ii. Function: `real = WMA(close, timeperiod=5)`

### 丁、客戶範例

日期	開盤	最高	最低	收盤	SMA	EMA	WMA
2014/4/30	8885.7	8890.09	8791.44	8791.44			
2014/5/2	8846.86	8875.9	8839.92	8867.32			
2014/5/5	8895.87	8911.08	8844.45	8870.43			
2014/5/6	8888.45	8927.39	8853.72	8912.39			
2014/5/7	8903.72	8911.03	8856.98	8893.22	8866.96	8866.96	8883.54
2014/5/8	8925.21	8941.46	8891.74	8930.9	8894.85	8888.27	8904.85
2014/5/9	8943.14	8945.63	8878.32	8889.69	8899.33	8888.75	8903.13
2014/5/12	8893.72	8898.31	8803.43	8808.61	8886.96	8862.03	8872.89
2014/5/13	8865.61	8886.66	8809.06	8817.94	8868.07	8847.34	8849.88

### 戊、Ta-lib 運算結果

DATE	OPEN	HIGH	LOW	CLOSE	SMA	EMA	WMA
2014/4/30	8885.7	8890.09	8791.44	8791.44			
2014/5/2	8846.86	8875.9	8839.92	8867.32			
2014/5/5	8895.87	8911.08	8844.45	8870.43			
2014/5/6	8888.45	8927.39	8853.72	8912.39			
2014/5/7	8903.72	8911.03	8856.98	8893.22	8866.96	8866.96	8883.535
2014/5/8	8925.21	8941.46	8891.74	8930.9	8894.852	8888.273	8904.849
2014/5/9	8943.14	8945.63	8878.32	8889.69	8899.326	8888.746	8903.128
2014/5/12	8893.72	8898.31	8803.43	8808.61	8886.962	8862.034	8872.889
2014/5/13	8865.61	8886.66	8809.06	8817.94	8868.072	8847.336	8849.882

### 己、結論 python 計算結果較為精準

## 2. KDJ 指標

### 甲、RSV

- i. Ta-lib 沒有提供方法

### 乙、K、D

- i. Group: Momentum Indicator Functions
- ii. Function: slowk, slowd = STOCH(high, low, close, fastk\_period=1, slowk\_period=2, slowk\_matype=0, slowd\_period=2, slowd\_matype=0)

### 丙、J

- i. Ta-lib 沒有提供方法

### 丁、客戶範例

日期	開盤	最高	最低	收盤	RSV	K	D	J
2014/4/30	8885.7	8890.0	8791.4	8791.4	0.00000	50	50	
2014/5/2	8846.8	8875.9	8839.9	8867.3	76.1534	58.717	52.905	70.341
2014/5/5	8895.8	8911.0	8844.4	8870.4	38.9914	52.142	52.651	51.124
2014/5/6	8888.4	8927.3	8853.7	8912.3	79.6389	61.307	55.536	72.849
2014/5/7	8903.7	8911.0	8856.9	8893.2	67.0490	63.221	58.098	73.467
2014/5/8	8925.2	8941.4	8891.7	8930.9	78.7610	68.401	61.532	82.138
2014/5/9	8943.1	8945.6	8878.3	8889.6	16.8919	51.231	58.099	37.496
2014/5/12	8893.7	8898.3	8803.4	8808.6	5.45953	35.974	50.724	6.4745
2014/5/13	8865.6	8886.6	8809.0	8817.9	11.4433	27.797	43.081	-

### 戊、Ta-lib 運算結果

DATE	OPEN	HIGH	LOW	CLOSE	K	D	J
2014/4/30	8885.7	8890.09	8791.44	8791.44			
2014/5/2	8846.86	8875.9	8839.92	8867.32			
2014/5/5	8895.87	8911.08	8844.45	8870.43	57.57243	47.82457	77.06815
2014/5/6	8888.45	8927.39	8853.72	8912.39	59.31519	58.44381	61.05794
2014/5/7	8903.72	8911.03	8856.98	8893.22	73.34398	66.32958	87.37277
2014/5/8	8925.21	8941.46	8891.74	8930.9	72.90505	73.12451	72.46611

2014/5/9	8943.14	8945.63	8878.32	8889.69	47.82653	60.36579	22.74801
2014/5/12	8893.72	8898.31	8803.43	8808.61	11.17576	29.50114	-25.475
2014/5/13	8865.61	8886.66	8809.06	8817.94	8.451413	9.813587	5.727067

己、自行撰寫函式結果

DATE	OPEN	HIGH	LOW	CLOSE	RSV	K	D	J
2014/4/30	8885.7	8890.09	8791.44	8791.44	0	50	50	50
2014/5/2	8846.86	8875.9	8839.92	8867.32	76.15342	58.71781	52.90594	70.34155
2014/5/5	8895.87	8911.08	8844.45	8870.43	38.99145	52.14235	52.65141	51.12424
2014/5/6	8888.45	8927.39	8853.72	8912.39	79.63893	61.30788	55.5369	72.84984
2014/5/7	8903.72	8911.03	8856.98	8893.22	67.04903	63.2216	58.09846	73.46786
2014/5/8	8925.21	8941.46	8891.74	8930.9	78.76106	68.40142	61.53278	82.13869
2014/5/9	8943.14	8945.63	8878.32	8889.69	16.89199	51.23161	58.09906	37.49671
2014/5/12	8893.72	8898.31	8803.43	8808.61	5.459528	35.97425	50.72412	6.474504
2014/5/13	8865.61	8886.66	8809.06	8817.94	11.4433	27.79727	43.08184	-2.77188

庚、結論

Ta-lib 之所以不能達到客戶需求原因有二。一，為客戶要求空資料值預設為 50，Ta-lib 無法自定義空資料填入值，皆使用預設值 0。二，客戶計算 K, D, J 值時要求以加權平均計算( 例:  $(RSV*1 + K_{last}*2)/3$  )，而 Ta-lib 只選擇預設的 9 個 MA\_TYPE，不能夠自定義。

### 3. RSI 指標

#### 甲、RSI

- i. Group: Momentum Indicator Functions
- ii. Function: real = RSI(close, timeperiod=9)

#### 乙、客戶範例

日期	開盤	最高	最低	收盤	RSI
2014/4/30	8885.7	8890.09	8791.44	8791.44	
2014/5/2	8846.86	8875.9	8839.92	8867.32	
2014/5/5	8895.87	8911.08	8844.45	8870.43	
2014/5/6	8888.45	8927.39	8853.72	8912.39	
2014/5/7	8903.72	8911.03	8856.98	8893.22	
2014/5/8	8925.21	8941.46	8891.74	8930.9	
2014/5/9	8943.14	8945.63	8878.32	8889.69	
2014/5/12	8893.72	8898.31	8803.43	8808.61	
2014/5/13	8865.61	8886.66	8809.06	8817.94	
2014/5/14	8842.05	8875.16	8812.19	8875.16	61.41719
2014/5/15	8852.92	8880.65	8839.44	8880.65	52.24979
2014/5/16	8857.12	8896.72	8816.92	8888.45	52.99395
2014/5/19	8901.54	8912.35	8877.46	8899.9	47.69071
2014/5/20	8922.08	8930.79	8887.79	8887.79	48.96913

#### 丙、Ta-lib 運算結果

DATE	OPEN	HIGH	LOW	CLOSE	RSI
2014/4/30	8885.7	8890.09	8791.44	8791.44	
2014/5/2	8846.86	8875.9	8839.92	8867.32	
2014/5/5	8895.87	8911.08	8844.45	8870.43	
2014/5/6	8888.45	8927.39	8853.72	8912.39	
2014/5/7	8903.72	8911.03	8856.98	8893.22	
2014/5/8	8925.21	8941.46	8891.74	8930.9	
2014/5/9	8943.14	8945.63	8878.32	8889.69	
2014/5/12	8893.72	8898.31	8803.43	8808.61	
2014/5/13	8865.61	8886.66	8809.06	8817.94	
2014/5/14	8842.05	8875.16	8812.19	8875.16	61.41719
2014/5/15	8852.92	8880.65	8839.44	8880.65	62.05637
2014/5/16	8857.12	8896.72	8816.92	8888.45	63.03517
2014/5/19	8901.54	8912.35	8877.46	8899.9	64.54556
2014/5/20	8922.08	8930.79	8887.79	8887.79	61.55302

丁、自行撰寫函式結果

DATE	OPEN	HIGH	LOW	CLOSE	RSI
2014/4/30	8885.7	8890.09	8791.44	8791.44	
2014/5/2	8846.86	8875.9	8839.92	8867.32	
2014/5/5	8895.87	8911.08	8844.45	8870.43	
2014/5/6	8888.45	8927.39	8853.72	8912.39	
2014/5/7	8903.72	8911.03	8856.98	8893.22	
2014/5/8	8925.21	8941.46	8891.74	8930.9	
2014/5/9	8943.14	8945.63	8878.32	8889.69	
2014/5/12	8893.72	8898.31	8803.43	8808.61	
2014/5/13	8865.61	8886.66	8809.06	8817.94	
2014/5/14	8842.05	8875.16	8812.19	8875.16	61.41719
2014/5/15	8852.92	8880.65	8839.44	8880.65	52.24979
2014/5/16	8857.12	8896.72	8816.92	8888.45	52.99395
2014/5/19	8901.54	8912.35	8877.46	8899.9	47.69071
2014/5/20	8922.08	8930.79	8887.79	8887.79	48.96913

戊、結論

Ta-lib 的 RSI 不清楚實際運作原理，與客戶不同之結果有二猜測猜測算法。一，Ta-lib 採累計平均，從第一天開始累計。二，Ta-lib 在算 PCT\_CHANGE 時有事先使用 MA 跑過一遍。

參考資料:

<https://www.joinquant.com/view/community/detail/3aa7716d1b3d0eb547a2fe987b4c1142>

#### 4. MACD 指標(指數平滑異同移動平均線)

##### 甲、DIF、MACD、OSC

Group: Momentum Indicator Functions

Function: macd, macdsignal, macdhist = MACD(close, fastperiod=12,  
slowperiod=26, signalperiod=9)

##### 乙、客戶範例

DIF	MACD	OSC
106.43487		
105.85300		
108.33638		
110.15029		
108.77697		
105.56495		
102.39542		
101.38412		
102.40634	105.70026	-3.293922
105.24205	105.60862	-0.366569
104.66499	105.41989	-0.754903
99.50775	104.23746	-4.729715
94.65048	102.32007	-7.669589

##### 丙、Ta-lib 運算結果

DIF	MACD	OSC
102.9972	104.5442	-1.54702
106.0081	104.837	1.171152
103.7273	104.615	-0.88776
97.13335	103.1187	-5.98534
92.28418	100.9518	-8.66761
87.11102	98.18363	-11.0726
88.3497	96.21684	-7.86715
87.18775	94.41103	-7.22327
92.16335	93.96149	-1.79814

##### 丁、自行撰寫函式結果

DIF	MACD	OSC
106.4349		
105.853		
108.3364		

110.1503		
108.777		
105.5649		
102.3954		
101.3841		
102.4063	105.7003	-3.29392
105.242	105.6086	-0.36657
104.665	105.4199	-0.7549
99.50775	104.2375	-4.72971
94.65048	102.3201	-7.66959

#### 戊、結論

使用 Ta-lib 的運算結果與客戶需求不符，一是因為用算過程中會自動導入 MA 計算，二是輸出格式不符。



## 5. 布林通道

### 甲、Upperband, lowerband, SMA

- i. Group: Overlap Studies Function
- ii. Function: upperband, middleband, lowerband = BBANDS(close, timeperiod=5, nbdevup=2, nbdevdn=2, matype=0)

### 乙、客戶範例

$\sigma$	上軌	中軌	下軌
85.0843	9083.5	8913.4	8743.2
90.5867	9110.4	8929.2	8748.1
94.9833	9129.6	8939.7	8749.7
101.876	9156.1	8952.3	8748.6
107.984	9178.7	8962.7	8746.7
113.636	9202.3	8975.1	8747.8
118.484	9222.2	8985.3	8748.3
122.554	9244	8998.9	8753.8
123.658	9266.9	9019.6	8772.3
122.598	9285.4	9040.2	8795

### 丙、Ta-lib 運算結果

上軌	中軌	下軌
9079.224	8913.364	8747.504
9105.828	8929.242	8752.656
9124.828	8939.672	8754.515
9150.917	8952.323	8753.729
9173.201	8962.702	8752.202
9196.594	8975.077	8753.559
9216.222	8985.255	8754.287
9237.809	8998.907	8760.005

### 丁、自行撰寫函式結果

上軌	中軌	下軌
9083.533	8913.364	8743.195
9110.415	8929.242	8748.069
9129.638	8939.672	8749.705
9156.076	8952.323	8748.57
9178.67	8962.702	8746.733
9202.349	8975.077	8747.804
9222.222	8985.255	8748.287
9244.015	8998.907	8753.799

戊、結論 SMA 的運算上並無不同，應是標準差計算上有些許落差。

## 6. Hull MA(HMA)赫爾移動平均線

甲、Ta-lib doesn't support

乙、客戶範例

	8848.63
	8843.16
	8855.71
	8873.28
	8887.76
	8891.33
	8899.38
	8920.13
	8961.16
	9003.4
	9047.11
	9081.56
	9102.69
	9110.3

丙、自行撰寫函式結果

8848.631  
8843.165  
8855.706  
8873.275  
8887.761  
8891.327  
8899.381  
8920.127  
8961.165  
9003.405  
9047.11  
9081.562  
9102.688  
9110.303  
9112.367

丁、結論，Ta-lib 沒有提供，單純計算即可