Alligators_Gator_Oscillator

September 29, 2021

1 Gator Oscillator

https://www.metatrader5.com/en/terminal/help/indicators/bw_indicators/go

```
[1]: import numpy as np
     import pandas as pd
     import matplotlib.pyplot as plt

     import warnings
     warnings.filterwarnings("ignore")

     # fix_yahoo_finance is used to fetch data
     import fix_yahoo_finance as yf
     yf.pdr_override()
```

```
[2]: # input
     symbol = 'AAPL'
     start = '2018-08-01'
     end = '2019-01-01'

     # Read data
     df = yf.download(symbol,start,end)

     # View Columns
     df.head()
```

```
[********************100%***********************]  1 of 1 downloaded
```

```
[2]:                  Open        High         Low       Close    Adj Close  \
     Date
     2018-08-01  199.130005  201.759995  197.309998  201.500000  199.243088
     2018-08-02  200.580002  208.380005  200.350006  207.389999  205.067123
     2018-08-03  207.029999  208.740005  205.479996  207.990005  205.660416
     2018-08-06  208.000000  209.250000  207.070007  209.070007  206.728317
     2018-08-07  209.320007  209.500000  206.759995  207.110001  204.790268

                   Volume
     Date
```

```
2018-08-01  67935700
2018-08-02  62404000
2018-08-03  33447400
2018-08-06  25425400
2018-08-07  25587400
```

```python
[3]: def SMMA(price, n, m=3):
         SMMA = np.array([np.nan] * len(price))
         SMMA[n - 2] = price[:n - 1].mean()
         for i in range(n - 1, len(price)):
             SMMA[i] = (SMMA [i - 1] * (n - 2) + 2 * price[i]) / n
         return SMMA
```

```python
[4]: medianprice = (df['High']/2) + (df['Low']/2)
     df['Jaw'] = SMMA(medianprice,13,8)
     df['Teeth'] = SMMA(medianprice,8 ,5)
     df['Lips']  = SMMA(medianprice,5 ,3)
```

```python
[5]: df
```

```
[5]:                 Open        High         Low       Close    Adj Close  \
     Date
     2018-08-01  199.130005  201.759995  197.309998  201.500000  199.243088
     2018-08-02  200.580002  208.380005  200.350006  207.389999  205.067123
     2018-08-03  207.029999  208.740005  205.479996  207.990005  205.660416
     2018-08-06  208.000000  209.250000  207.070007  209.070007  206.728317
     2018-08-07  209.320007  209.500000  206.759995  207.110001  204.790268
     2018-08-08  206.050003  207.809998  204.520004  207.250000  204.928696
     2018-08-09  207.279999  209.779999  207.199997  208.880005  206.540436
     2018-08-10  207.360001  209.100006  206.669998  207.529999  205.925232
     2018-08-13  207.699997  210.949997  207.699997  208.869995  207.254883
     2018-08-14  210.160004  210.559998  208.259995  209.750000  208.128067
     2018-08-15  209.220001  210.740005  208.330002  210.240005  208.614273
     2018-08-16  211.750000  213.809998  211.470001  213.320007  211.670471
     2018-08-17  213.440002  217.949997  213.160004  217.580002  215.897522
     2018-08-20  218.100006  219.179993  215.110001  215.460007  213.793930
     2018-08-21  216.800003  217.190002  214.029999  215.039993  213.377167
     2018-08-22  214.100006  216.360001  213.839996  215.050003  213.387085
     2018-08-23  214.649994  217.050003  214.600006  215.490005  213.823685
     2018-08-24  216.600006  216.899994  215.110001  216.160004  214.488495
     2018-08-27  217.149994  218.740005  216.330002  217.940002  216.254745
     2018-08-28  219.009995  220.539993  218.919998  219.699997  218.001129
     2018-08-29  220.149994  223.490005  219.410004  222.979996  221.255753
     2018-08-30  223.250000  228.259995  222.399994  225.029999  223.289917
     2018-08-31  226.509995  228.869995  226.000000  227.630005  225.869812
     2018-09-04  228.410004  229.179993  226.630005  228.360001  226.594162
     2018-09-05  228.990005  229.669998  225.100006  226.869995  225.115677
```

```
2018-09-06  226.229996  227.350006  221.300003  223.100006  221.374847
2018-09-07  221.850006  225.369995  220.710007  221.300003  219.588760
2018-09-10  220.949997  221.850006  216.470001  218.330002  216.641724
2018-09-11  218.009995  224.300003  216.559998  223.850006  222.119049
2018-09-12  224.940002  225.000000  219.839996  221.070007  219.360550
...            ...         ...         ...         ...         ...
2018-11-15  188.389999  191.970001  186.899994  191.410004  190.592590
2018-11-16  190.500000  194.970001  189.460007  193.529999  192.703537
2018-11-19  190.000000  190.699997  184.990005  185.860001  185.066284
2018-11-20  178.369995  181.470001  175.509995  176.979996  176.224197
2018-11-21  179.729996  180.270004  176.550003  176.779999  176.025055
2018-11-23  174.940002  176.600006  172.100006  172.289993  171.554230
2018-11-26  174.240005  174.949997  170.259995  174.619995  173.874283
2018-11-27  171.509995  174.770004  170.880005  174.240005  173.495911
2018-11-28  176.729996  181.289993  174.929993  180.940002  180.167297
2018-11-29  182.660004  182.800003  177.699997  179.550003  178.783234
2018-11-30  180.289993  180.330002  177.029999  178.580002  177.817383
2018-12-03  184.460007  184.940002  181.210007  184.820007  184.030731
2018-12-04  180.949997  182.389999  176.270004  176.690002  175.935455
2018-12-06  171.759995  174.779999  170.419998  174.720001  173.973862
2018-12-07  173.490005  174.490005  168.300003  168.490005  167.770477
2018-12-10  165.000000  170.089996  163.330002  169.600006  168.875732
2018-12-11  171.660004  171.789993  167.000000  168.630005  167.909866
2018-12-12  170.399994  171.919998  169.020004  169.100006  168.377869
2018-12-13  170.490005  172.570007  169.550003  170.949997  170.219955
2018-12-14  169.000000  169.080002  165.279999  165.479996  164.773315
2018-12-17  165.449997  168.350006  162.729996  163.940002  163.239899
2018-12-18  165.380005  167.529999  164.389999  166.070007  165.360809
2018-12-19  166.000000  167.449997  159.089996  160.889999  160.202927
2018-12-20  160.399994  162.110001  155.300003  156.830002  156.160263
2018-12-21  156.860001  158.160004  149.630005  150.729996  150.086304
2018-12-24  148.149994  151.550003  146.589996  146.830002  146.202972
2018-12-26  148.300003  157.229996  146.720001  157.169998  156.498810
2018-12-27  155.839996  156.770004  150.070007  156.149994  155.483154
2018-12-28  157.500000  158.520004  154.550003  156.229996  155.562820
2018-12-31  158.529999  159.360001  156.479996  157.740005  157.066376

              Volume         Jaw       Teeth        Lips
Date
2018-08-01  67935700         NaN         NaN         NaN
2018-08-02  62404000         NaN         NaN         NaN
2018-08-03  33447400         NaN         NaN         NaN
2018-08-06  25425400         NaN         NaN  204.792501
2018-08-07  25587400         NaN         NaN  206.127500
2018-08-08  22525500         NaN         NaN  206.142500
2018-08-09  23469200         NaN  205.993572  207.081499
2018-08-10  24611200         NaN  206.466429  207.402900
```

2018-08-13	25869100	NaN	207.181071	208.171739
2018-08-14	20748000	NaN	207.738303	208.667042
2018-08-15	28807600	NaN	208.187478	209.014227
2018-08-16	28500400	207.562500	209.300608	210.464536
2018-08-17	35427000	208.792116	210.864206	212.500722
2018-08-20	30287700	210.077174	212.434404	214.358432
2018-08-21	26159800	210.928378	213.228303	214.859059
2018-08-22	19018100	211.570166	213.696227	214.955435
2018-08-23	18883200	212.224757	214.228421	215.303263
2018-08-24	18476400	212.806332	214.672565	215.583957
2018-08-27	20525100	213.533820	215.388175	216.364375
2018-08-28	22776800	214.487078	216.473630	217.710623
2018-08-29	27254800	215.558297	217.717724	219.206376
2018-08-30	48793800	217.061635	219.620791	221.655823
2018-08-31	43340100	218.657537	221.574343	223.967493
2018-09-04	27390100	220.080224	223.157007	225.542495
2018-09-05	33333000	221.204036	224.214006	226.279498
2018-09-06	34290000	221.684185	224.241755	225.497701
2018-09-07	37619800	221.892772	223.941317	224.514621
2018-09-10	39516500	221.472346	222.745988	222.372774
2018-09-11	35749000	221.311985	222.166991	221.595665
2018-09-12	49278700	221.482449	222.230243	221.925398
…	…	…	…	…
2018-11-15	46478800	201.380431	196.826954	193.127490
2018-11-16	36928300	199.970365	195.673966	192.762496
2018-11-19	41925300	198.104925	193.716725	190.795498
2018-11-20	67825200	195.087244	189.910043	185.873298
2018-11-21	31124200	192.521514	187.035033	182.887980
2018-11-23	23624000	189.725898	183.863776	179.472790
2018-11-26	44998500	187.091913	181.049081	176.725673
2018-11-27	41387400	184.897004	178.993062	175.165405
2018-11-28	46062500	183.852848	178.772295	176.343240
2018-11-29	41770000	183.298564	179.141721	177.905944
2018-11-30	39531500	182.588016	179.026291	178.215567
2018-12-03	40802500	182.662937	180.038469	180.159342
2018-12-04	41344300	182.150178	179.861352	179.827606
2018-12-06	43098400	180.680919	178.046014	176.936563
2018-12-07	42281600	179.252317	176.383261	174.719939
2018-12-10	62026000	177.322730	173.964946	171.515963
2018-12-11	47281700	176.103078	172.822458	170.667577
2018-12-12	35627700	175.236451	172.234344	170.588546
2018-12-13	31898600	174.593921	171.940759	170.777130
2018-12-14	40703700	173.453318	170.750570	169.338278
2018-12-17	44287900	172.235884	169.447927	167.818967
2018-12-18	33841500	171.270364	168.575945	167.075380
2018-12-19	49047300	170.039538	167.249458	165.553227
2018-12-20	64773000	168.295763	165.113344	162.813937

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2018-12-21   95744600   166.080262   162.308759   159.246364
2018-12-24   37169200   163.463298   158.999069   155.175818
2018-12-26   58582500   161.695868   157.243052   153.895490
2018-12-27   53117100   160.422658   156.287290   153.705296
2018-12-28   42291400   159.824557   156.349218   154.837179
2018-12-31   35003500   159.531548   156.741913   156.070307

[105 rows x 9 columns]
```

https://mahifx.com/mfxtrade/indicators/gator-oscillator

Top bars of histogram (Above zero) = Absolute value (Jaw – Teeth)

Bottom bars of histogram (Below zero) = - {Absolute value of (Teeth – Lips)}

```
[6]: df['Top_Bars'] = abs(df['Jaw'] - df['Teeth'])
     df['Bottom_Bars'] = -(abs(df['Teeth'] - df['Lips']))
```

```
[7]: df
```

```
[7]:                  Open         High          Low        Close     Adj Close  \
     Date
     2018-08-01  199.130005   201.759995   197.309998   201.500000   199.243088
     2018-08-02  200.580002   208.380005   200.350006   207.389999   205.067123
     2018-08-03  207.029999   208.740005   205.479996   207.990005   205.660416
     2018-08-06  208.000000   209.250000   207.070007   209.070007   206.728317
     2018-08-07  209.320007   209.500000   206.759995   207.110001   204.790268
     2018-08-08  206.050003   207.809998   204.520004   207.250000   204.928696
     2018-08-09  207.279999   209.779999   207.199997   208.880005   206.540436
     2018-08-10  207.360001   209.100006   206.669998   207.529999   205.925232
     2018-08-13  207.699997   210.949997   207.699997   208.869995   207.254883
     2018-08-14  210.160004   210.559998   208.259995   209.750000   208.128067
     2018-08-15  209.220001   210.740005   208.330002   210.240005   208.614273
     2018-08-16  211.750000   213.809998   211.470001   213.320007   211.670471
     2018-08-17  213.440002   217.949997   213.160004   217.580002   215.897522
     2018-08-20  218.100006   219.179993   215.110001   215.460007   213.793930
     2018-08-21  216.800003   217.190002   214.029999   215.039993   213.377167
     2018-08-22  214.100006   216.360001   213.839996   215.050003   213.387085
     2018-08-23  214.649994   217.050003   214.600006   215.490005   213.823685
     2018-08-24  216.600006   216.899994   215.110001   216.160004   214.488495
     2018-08-27  217.149994   218.740005   216.330002   217.940002   216.254745
     2018-08-28  219.009995   220.539993   218.919998   219.699997   218.001129
     2018-08-29  220.149994   223.490005   219.410004   222.979996   221.255753
     2018-08-30  223.250000   228.259995   222.399994   225.029999   223.289917
     2018-08-31  226.509995   228.869995   226.000000   227.630005   225.869812
     2018-09-04  228.410004   229.179993   226.630005   228.360001   226.594162
     2018-09-05  228.990005   229.669998   225.100006   226.869995   225.115677
     2018-09-06  226.229996   227.350006   221.300003   223.100006   221.374847
```

5

2018-09-07	221.850006	225.369995	220.710007	221.300003	219.588760
2018-09-10	220.949997	221.850006	216.470001	218.330002	216.641724
2018-09-11	218.009995	224.300003	216.559998	223.850006	222.119049
2018-09-12	224.940002	225.000000	219.839996	221.070007	219.360550
…	…	…	…	…	…
2018-11-15	188.389999	191.970001	186.899994	191.410004	190.592590
2018-11-16	190.500000	194.970001	189.460007	193.529999	192.703537
2018-11-19	190.000000	190.699997	184.990005	185.860001	185.066284
2018-11-20	178.369995	181.470001	175.509995	176.979996	176.224197
2018-11-21	179.729996	180.270004	176.550003	176.779999	176.025055
2018-11-23	174.940002	176.600006	172.100006	172.289993	171.554230
2018-11-26	174.240005	174.949997	170.259995	174.619995	173.874283
2018-11-27	171.509995	174.770004	170.880005	174.240005	173.495911
2018-11-28	176.729996	181.289993	174.929993	180.940002	180.167297
2018-11-29	182.660004	182.800003	177.699997	179.550003	178.783234
2018-11-30	180.289993	180.330002	177.029999	178.580002	177.817383
2018-12-03	184.460007	184.940002	181.210007	184.820007	184.030731
2018-12-04	180.949997	182.389999	176.270004	176.690002	175.935455
2018-12-06	171.759995	174.779999	170.419998	174.720001	173.973862
2018-12-07	173.490005	174.490005	168.300003	168.490005	167.770477
2018-12-10	165.000000	170.089996	163.330002	169.600006	168.875732
2018-12-11	171.660004	171.789993	167.000000	168.630005	167.909866
2018-12-12	170.399994	171.919998	169.020004	169.100006	168.377869
2018-12-13	170.490005	172.570007	169.550003	170.949997	170.219955
2018-12-14	169.000000	169.080002	165.279999	165.479996	164.773315
2018-12-17	165.449997	168.350006	162.729996	163.940002	163.239899
2018-12-18	165.380005	167.529999	164.389999	166.070007	165.360809
2018-12-19	166.000000	167.449997	159.089996	160.889999	160.202927
2018-12-20	160.399994	162.110001	155.300003	156.830002	156.160263
2018-12-21	156.860001	158.160004	149.630005	150.729996	150.086304
2018-12-24	148.149994	151.550003	146.589996	146.830002	146.202972
2018-12-26	148.300003	157.229996	146.720001	157.169998	156.498810
2018-12-27	155.839996	156.770004	150.070007	156.149994	155.483154
2018-12-28	157.500000	158.520004	154.550003	156.229996	155.562820
2018-12-31	158.529999	159.360001	156.479996	157.740005	157.066376

	Volume	Jaw	Teeth	Lips	Top_Bars \
Date					
2018-08-01	67935700	NaN	NaN	NaN	NaN
2018-08-02	62404000	NaN	NaN	NaN	NaN
2018-08-03	33447400	NaN	NaN	NaN	NaN
2018-08-06	25425400	NaN	NaN	204.792501	NaN
2018-08-07	25587400	NaN	NaN	206.127500	NaN
2018-08-08	22525500	NaN	NaN	206.142500	NaN
2018-08-09	23469200	NaN	205.993572	207.081499	NaN
2018-08-10	24611200	NaN	206.466429	207.402900	NaN
2018-08-13	25869100	NaN	207.181071	208.171739	NaN

2018-08-14	20748000	NaN	207.738303	208.667042	NaN
2018-08-15	28807600	NaN	208.187478	209.014227	NaN
2018-08-16	28500400	207.562500	209.300608	210.464536	1.738108
2018-08-17	35427000	208.792116	210.864206	212.500722	2.072091
2018-08-20	30287700	210.077174	212.434404	214.358432	2.357230
2018-08-21	26159800	210.928378	213.228303	214.859059	2.299925
2018-08-22	19018100	211.570166	213.696227	214.955435	2.126061
2018-08-23	18883200	212.224757	214.228421	215.303263	2.003665
2018-08-24	18476400	212.806332	214.672565	215.583957	1.866233
2018-08-27	20525100	213.533820	215.388175	216.364375	1.854355
2018-08-28	22776800	214.487078	216.473630	217.710623	1.986552
2018-08-29	27254800	215.558297	217.717724	219.206376	2.159426
2018-08-30	48793800	217.061635	219.620791	221.655823	2.559156
2018-08-31	43340100	218.657537	221.574343	223.967493	2.916806
2018-09-04	27390100	220.080224	223.157007	225.542495	3.076783
2018-09-05	33333000	221.204036	224.214006	226.279498	3.009970
2018-09-06	34290000	221.684185	224.241755	225.497701	2.557571
2018-09-07	37619800	221.892772	223.941317	224.514621	2.048545
2018-09-10	39516500	221.472346	222.745988	222.372774	1.273643
2018-09-11	35749000	221.311985	222.166991	221.595665	0.855006
2018-09-12	49278700	221.482449	222.230243	221.925398	0.747794
...	...	...	...	...	...
2018-11-15	46478800	201.380431	196.826954	193.127490	4.553477
2018-11-16	36928300	199.970365	195.673966	192.762496	4.296399
2018-11-19	41925300	198.104925	193.716725	190.795498	4.388200
2018-11-20	67825200	195.087244	189.910043	185.873298	5.177200
2018-11-21	31124200	192.521514	187.035033	182.887980	5.486481
2018-11-23	23624000	189.725898	183.863776	179.472790	5.862121
2018-11-26	44998500	187.091913	181.049081	176.725673	6.042831
2018-11-27	41387400	184.897004	178.993062	175.165405	5.903942
2018-11-28	46062500	183.852848	178.772295	176.343240	5.080553
2018-11-29	41770000	183.298564	179.141721	177.905944	4.156843
2018-11-30	39531500	182.588016	179.026291	178.215567	3.561725
2018-12-03	40802500	182.662937	180.038469	180.159342	2.624468
2018-12-04	41344300	182.150178	179.861352	179.827606	2.288825
2018-12-06	43098400	180.680919	178.046014	176.936563	2.634905
2018-12-07	42281600	179.252317	176.383261	174.719939	2.869056
2018-12-10	62026000	177.322730	173.964946	171.515963	3.357784
2018-12-11	47281700	176.103078	172.822458	170.667577	3.280620
2018-12-12	35627700	175.236451	172.234344	170.588546	3.002107
2018-12-13	31898600	174.593921	171.940759	170.777130	2.653162
2018-12-14	40703700	173.453318	170.750570	169.338278	2.702748
2018-12-17	44287900	172.235884	169.447927	167.818967	2.787957
2018-12-18	33841500	171.270364	168.575945	167.075380	2.694418
2018-12-19	49047300	170.039538	167.249458	165.553227	2.790080
2018-12-20	64773000	168.295763	165.113344	162.813937	3.182419
2018-12-21	95744600	166.080262	162.308759	159.246364	3.771503

```
2018-12-24   37169200   163.463298   158.999069   155.175818   4.464229
2018-12-26   58582500   161.695868   157.243052   153.895490   4.452816
2018-12-27   53117100   160.422658   156.287290   153.705296   4.135368
2018-12-28   42291400   159.824557   156.349218   154.837179   3.475339
2018-12-31   35003500   159.531548   156.741913   156.070307   2.789635


             Bottom_Bars
Date
2018-08-01         NaN
2018-08-02         NaN
2018-08-03         NaN
2018-08-06         NaN
2018-08-07         NaN
2018-08-08         NaN
2018-08-09   -1.087928
2018-08-10   -0.936471
2018-08-13   -0.990668
2018-08-14   -0.928739
2018-08-15   -0.826749
2018-08-16   -1.163928
2018-08-17   -1.636515
2018-08-20   -1.924028
2018-08-21   -1.630756
2018-08-22   -1.259208
2018-08-23   -1.074841
2018-08-24   -0.911391
2018-08-27   -0.976200
2018-08-28   -1.236993
2018-08-29   -1.488652
2018-08-30   -2.035032
2018-08-31   -2.393150
2018-09-04   -2.385488
2018-09-05   -2.065492
2018-09-06   -1.255945
2018-09-07   -0.573304
2018-09-10   -0.373215
2018-09-11   -0.571327
2018-09-12   -0.304845
…                  …
2018-11-15   -3.699464
2018-11-16   -2.911471
2018-11-19   -2.921227
2018-11-20   -4.036745
2018-11-21   -4.147053
2018-11-23   -4.390986
2018-11-26   -4.323409
2018-11-27   -3.827657
```

```
2018-11-28    -2.429054
2018-11-29    -1.235777
2018-11-30    -0.810724
2018-12-03    -0.120872
2018-12-04    -0.033747
2018-12-06    -1.109451
2018-12-07    -1.663322
2018-12-10    -2.448983
2018-12-11    -2.154882
2018-12-12    -1.645798
2018-12-13    -1.163630
2018-12-14    -1.412292
2018-12-17    -1.628960
2018-12-18    -1.500565
2018-12-19    -1.696232
2018-12-20    -2.299407
2018-12-21    -3.062395
2018-12-24    -3.823251
2018-12-26    -3.347561
2018-12-27    -2.581994
2018-12-28    -1.512039
2018-12-31    -0.671607

[105 rows x 11 columns]
```
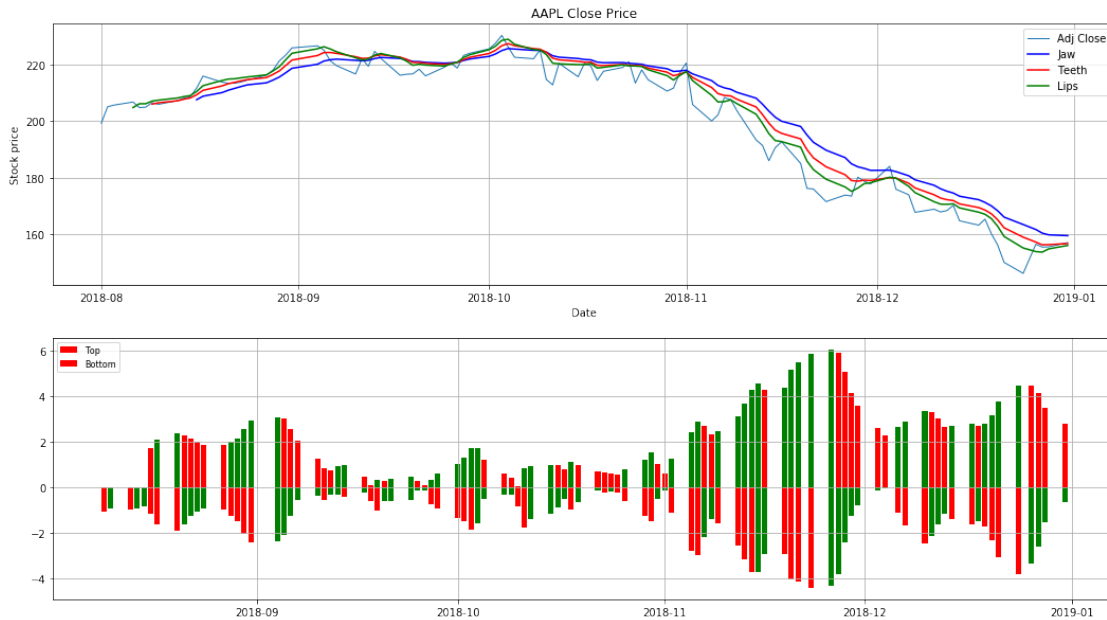
[8]:
```python
fig = plt.figure(figsize=(18,10))

ax1 = fig.add_subplot(2, 1, 1)
ax1.plot(df['Adj Close'],lw=1)
ax1.plot(df['Jaw'],color='blue')
ax1.plot(df['Teeth'],color='red')
ax1.plot(df['Lips'],color='green')
ax1.set_title(symbol + ' Close Price')
ax1.set_ylabel('Stock price')
ax1.set_xlabel('Date')
ax1.grid(True)
ax1.legend(loc='best')

ax2 = fig.add_subplot(2, 1, 2)
df['Positive_T'] = df.Top_Bars > df.Top_Bars.shift(1)
df['Positive_B'] = df.Bottom_Bars > df.Bottom_Bars.shift(1)
ax2.bar(df.index, df['Top_Bars'], color=df.Positive_T.map({True: 'g', False:
 ↪'r'}), label='Top')
ax2.bar(df.index, df['Bottom_Bars'], color=df.Positive_B.map({True: 'g', False:
 ↪'r'}), label='Bottom')
#ax2.bar(df.index, df['Top_Bars'],label='Top')
#ax2.bar(df.index, df['Bottom_Bars'],label='Bottom')
```

```
ax2.legend(loc=2,prop={'size':8})
ax2.grid(True)
```



```
[9]: from matplotlib import dates as mdates
     import datetime as dt

     dfc = df.copy()
     dfc['VolumePositive'] = dfc['Open'] < dfc['Adj Close']
     #dfc = dfc.dropna()
     dfc = dfc.reset_index()
     dfc['Date'] = mdates.date2num(dfc['Date'].astype(dt.date))
     dfc.head()
```

```
[9]:        Date        Open        High         Low       Close   Adj Close  \
     0  736907.0  199.130005  201.759995  197.309998  201.500000  199.243088
     1  736908.0  200.580002  208.380005  200.350006  207.389999  205.067123
     2  736909.0  207.029999  208.740005  205.479996  207.990005  205.660416
     3  736912.0  208.000000  209.250000  207.070007  209.070007  206.728317
     4  736913.0  209.320007  209.500000  206.759995  207.110001  204.790268


           Volume  Jaw  Teeth        Lips  Top_Bars  Bottom_Bars  Positive_T  \
     0    67935700  NaN    NaN         NaN       NaN          NaN       False
     1    62404000  NaN    NaN         NaN       NaN          NaN       False
     2    33447400  NaN    NaN         NaN       NaN          NaN       False
     3    25425400  NaN    NaN  204.792501       NaN          NaN       False
     4    25587400  NaN    NaN  206.127500       NaN          NaN       False
```

```
     Positive_B  VolumePositive
0      False              True
1      False              True
2      False             False
3      False             False
4      False             False
```

[10]:
```python
from mpl_finance import candlestick_ohlc

fig = plt.figure(figsize=(14,10))
ax1 = plt.subplot(2, 1, 1)
candlestick_ohlc(ax1,dfc.values, width=0.5, colorup='g', colordown='r', alpha=1.
 ↪0)
ax1.plot(df['Jaw'],color='blue')
ax1.plot(df['Teeth'],color='red')
ax1.plot(df['Lips'],color='green')
ax1.xaxis_date()
ax1.xaxis.set_major_formatter(mdates.DateFormatter('%d-%m-%Y'))
ax1.grid(True, which='both')
ax1.minorticks_on()
ax1v = ax1.twinx()
colors = dfc.VolumePositive.map({True: 'g', False: 'r'})
ax1v.bar(dfc.Date, dfc['Volume'], color=colors, alpha=0.4)
ax1v.axes.yaxis.set_ticklabels([])
ax1v.set_ylim(0, 3*df.Volume.max())
ax1.set_title('Stock '+ symbol +' Closing Price')
ax1.set_ylabel('Price')
ax1.legend(loc='best')

ax2 = fig.add_subplot(2, 1, 2)
df['Positive_T'] = df.Top_Bars > df.Top_Bars.shift(1)
df['Positive_B'] = df.Bottom_Bars > df.Bottom_Bars.shift(1)
ax2.bar(df.index, df['Top_Bars'], color=df.Positive_T.map({True: 'g', False:
 ↪'r'}), label='Top')
ax2.bar(df.index, df['Bottom_Bars'], color=df.Positive_B.map({True: 'g', False:
 ↪'r'}), label='Bottom')
ax2.legend(loc=2,prop={'size':8})
ax2.grid(True)
```