

lab7_15

July 15, 2019

```
[39]: import requests
      from bs4 import BeautifulSoup
      import numpy as np
      import pandas as pd

[3]: url = 'https://finance.yahoo.com/quote/AAPL/options?p=AAPL'
      source_code = requests.get(url)
      plaintext = source_code.text
      soup = BeautifulSoup(plaintext, 'html.parser')

[18]: calls = soup.findAll('table', {'class': 'calls'})

[29]: columns = calls[0].findAll('thead')

[30]: columns = columns[0].findAll('span')

[42]: n = len(columns)
      column_names = [0] * n
      for idx, val in enumerate(columns):
          column_names[idx] = val.getText()

[43]: column_names

[43]: ['Contract Name',
      'Last Trade Date',
      'Strike',
      'Last Price',
      'Bid',
      'Ask',
      'Change',
      '% Change',
      'Volume',
      'Open Interest',
      'Implied Volatility']

[33]: data = calls[0].findAll('tbody')

[36]: row_data = data[0].findAll('tr')

[37]: row_num = len(row_data)

[38]: row_num
```

[38]: 53

```
[61]: call_df = pd.DataFrame(columns = column_names)
      for row_val in row_data:
          row = [0] * n
          for col_idx, col_val in enumerate(row_val.findAll('td')):
              row[col_idx] = col_val.getText()
          temp = pd.DataFrame([row], columns = column_names)
          call_df = call_df.append(temp, ignore_index = True)
```

[63]: call_df.head(30)

```
[63]:      Contract Name      Last Trade Date  Strike Last Price  Bid \
0  AAPL190719C00080000  2019-07-15 12:31PM EDT   80.00    124.50  125.10
1  AAPL190719C00085000  2019-06-28 12:48PM EDT   85.00    114.40  119.95
2  AAPL190719C00090000   2019-07-11 9:32AM EDT   90.00    113.95  114.95
3  AAPL190719C00095000   2019-06-04 2:04PM EDT   95.00     84.83  109.25
4  AAPL190719C00100000  2019-07-12 10:47AM EDT  100.00    103.64  104.95
5  AAPL190719C00105000  2019-06-28 10:25AM EDT  105.00     92.88   99.95
6  AAPL190719C00110000  2019-07-15 10:23AM EDT  110.00     95.05   95.15
7  AAPL190719C00115000  2019-06-07 11:04AM EDT  115.00     85.25   87.95
8  AAPL190719C00120000   2019-07-15 1:23PM EDT  120.00     84.73   85.10
9  AAPL190719C00125000   2019-07-11 1:29PM EDT  125.00     78.20   79.95
10 AAPL190719C00130000   2019-07-15 2:32PM EDT  130.00     75.05   75.15
11 AAPL190719C00135000  2019-07-09 12:40PM EDT  135.00     66.25   69.95
12 AAPL190719C00140000   2019-07-15 2:28PM EDT  140.00     65.03   65.10
13 AAPL190719C00145000   2019-07-15 2:31PM EDT  145.00     60.10   60.15
14 AAPL190719C00150000   2019-07-15 3:58PM EDT  150.00     54.85   55.15
15 AAPL190719C00155000   2019-07-15 3:20PM EDT  155.00     50.05   50.15
16 AAPL190719C00160000   2019-07-15 3:59PM EDT  160.00     45.20   45.10
17 AAPL190719C00165000   2019-07-15 3:56PM EDT  165.00     40.00   40.15
18 AAPL190719C00170000   2019-07-15 2:57PM EDT  170.00     35.18   35.15
19 AAPL190719C00175000   2019-07-15 3:56PM EDT  175.00     30.05   30.15
20 AAPL190719C00180000   2019-07-15 3:59PM EDT  180.00     25.10   25.20
21 AAPL190719C00182500   2019-07-15 1:01PM EDT  182.50     22.10   22.65
22 AAPL190719C00185000   2019-07-15 3:48PM EDT  185.00     20.20   20.15
23 AAPL190719C00187500  2019-07-15 10:45AM EDT  187.50     17.69   17.50
24 AAPL190719C00190000   2019-07-15 3:59PM EDT  190.00     15.25   15.20
25 AAPL190719C00192500   2019-07-15 3:36PM EDT  192.50     12.72   12.70
26 AAPL190719C00195000   2019-07-15 3:59PM EDT  195.00     10.32   10.30
27 AAPL190719C00197500   2019-07-15 3:59PM EDT  197.50      7.70    7.85
28 AAPL190719C00200000   2019-07-15 3:59PM EDT  200.00      5.58    5.55
29 AAPL190719C00202500   2019-07-15 3:59PM EDT  202.50      3.50    3.50

      Ask Change % Change Volume Open Interest Implied Volatility
0  125.30  +0.88  +0.71%    336          1,106          319.53%
1  120.40   0.00      -      44           167          328.91%
2  115.40   0.00      -      1           60          309.38%
```

3	109.60	0.00	-	35	10	0.00%
4	105.40	0.00	-	1	68	272.66%
5	100.35	0.00	-	1	1	245.70%
6	95.35	+4.90	+5.44%	16	1,120	199.22%
7	90.65	0.00	-	40	0	253.91%
8	85.30	+2.88	+3.52%	69	377	189.84%
9	80.35	0.00	-	26	385	186.72%
10	75.35	+2.05	+2.81%	27	772	149.22%
11	70.45	0.00	-	1	338	173.24%
12	65.35	+1.15	+1.80%	3	687	114.06%
13	60.30	+1.60	+2.74%	32	493	104.69%
14	55.30	+1.48	+2.77%	78	2,124	95.31%
15	50.30	+1.75	+3.62%	33	1,134	85.94%
16	45.30	+1.75	+4.03%	48	1,980	95.31%
17	40.35	+1.70	+4.44%	10	1,722	76.56%
18	35.35	+1.88	+5.65%	49	6,701	67.19%
19	30.35	+1.69	+5.96%	108	20,936	57.81%
20	25.35	+1.80	+7.73%	104	18,792	51.95%
21	22.85	+1.30	+6.25%	27	102	53.22%
22	20.35	+1.90	+10.38%	1,023	15,184	48.05%
23	17.90	+1.87	+11.82%	63	590	45.31%
24	15.35	+1.70	+12.55%	6,112	28,105	37.60%
25	12.90	+1.63	+14.70%	36	378	34.38%
26	10.40	+1.75	+20.42%	1,212	15,553	28.71%
27	8.05	+1.44	+23.00%	307	11,732	26.81%
28	5.70	+1.34	+31.60%	7,192	40,722	22.93%
29	3.55	+1.06	+43.44%	5,888	7,740	19.90%

```
[66]: def get_options(ticker, option_type):
    url = 'https://finance.yahoo.com/quote/' + ticker + '/options?p=' + ticker
    source_code = requests.get(url)
    plaintext = source_code.text
    soup = BeautifulSoup(plaintext, 'html.parser')
    if option_type == 'call':
        calls = soup.findAll('table', {'class': 'calls'})
    else:
        calls = soup.findAll('table', {'class': 'puts'})
    columns = calls[0].findAll('thead')
    columns = columns[0].findAll('span')
    n = len(columns)
    column_names = [0] * n
    for idx, val in enumerate(columns):
        column_names[idx] = val.getText()
    data = calls[0].findAll('tbody')
    row_data = data[0].findAll('tr')
    row_num = len(row_data)
    call_df = pd.DataFrame(columns = column_names)
```

```

for row_val in row_data:
    row = [0] * n
    for col_idx, col_val in enumerate(row_val.findAll('td')):
        row[col_idx] = col_val.getText()
    temp = pd.DataFrame([row], columns = column_names)
    call_df = call_df.append(temp, ignore_index = True)
return call_df

```

```

[68]: puts = get_options('FB', 'put')
      calls = get_options('FB', 'call')

```

```

[69]: puts.head()

```

```

[69]:      Contract Name      Last Trade Date  Strike Last Price  Bid  Ask  \
0  FB190719P00090000  2019-06-07 3:05PM EDT   90.00      0.01  0.00  0.01
1  FB190719P00095000  2019-06-18 3:39PM EDT   95.00      0.01  0.00  0.21
2  FB190719P00100000  2019-06-18 12:25PM EDT  100.00      0.01  0.00  0.01
3  FB190719P00105000  2019-06-18 10:33AM EDT  105.00      0.01  0.00  0.01
4  FB190719P00110000  2019-07-05 3:14PM EDT  110.00      0.01  0.00  0.03

```

```

      Change % Change Volume Open Interest Implied Volatility
0    0.00      -      400           536      212.50%
1    0.00      -        1          5,286      267.97%
2    0.00      -        4         20,230      187.50%
3    0.00      -      186          4,297      175.00%
4    0.00      -        3          2,996      179.69%

```

```

[70]: calls.head()

```

```

[70]:      Contract Name      Last Trade Date  Strike Last Price  Bid  \
0  FB190719C00090000  2019-07-11 9:34AM EDT   90.00    112.55  113.15
1  FB190719C00095000  2019-07-09 1:51PM EDT   95.00    103.95  108.15
2  FB190719C00100000  2019-06-19 11:08AM EDT  100.00     86.35  101.85
3  FB190719C00110000  2019-07-11 1:00PM EDT  110.00     91.41   93.40
4  FB190719C00115000  2019-06-26 1:36PM EDT  115.00     73.01   86.80

```

```

      Ask Change % Change Volume Open Interest Implied Volatility
0  114.70    0.00      -        1           29      234.38%
1  109.75    0.00      -        4           24      240.63%
2  106.10    0.00      -        2           10      237.50%
3   94.70    0.00      -        2           70      228.13%
4   91.10    0.00      -        -            0      184.38%

```

```

[71]: ticker = input('Enter the company ticker: ')
      option_type = input('Enter the option type: ')
      get_options(ticker, option_type)

```

```

Enter the company ticker: GOOGL
Enter the option type: call

```

[71]:

	Contract Name	Last Trade Date	Strike	Last Price \
0	GOOGL190719C00600000	2019-07-10 9:35AM EDT	600.00	536.10
1	GOOGL190719C00800000	2019-07-03 10:24AM EDT	800.00	325.00
2	GOOGL190719C00850000	2019-07-12 10:14AM EDT	850.00	291.49
3	GOOGL190719C00860000	2019-05-23 11:37AM EDT	860.00	285.70
4	GOOGL190719C00900000	2019-07-10 3:00PM EDT	900.00	236.68
5	GOOGL190719C00920000	2019-06-07 2:38PM EDT	920.00	155.30
6	GOOGL190719C00925000	2019-06-21 9:47AM EDT	925.00	192.73
7	GOOGL190719C00930000	2019-06-06 3:40PM EDT	930.00	126.00
8	GOOGL190719C00945000	2019-06-07 11:24AM EDT	945.00	252.35
9	GOOGL190719C00950000	2019-06-24 11:53AM EDT	950.00	171.18
10	GOOGL190719C00955000	2019-06-07 11:24AM EDT	955.00	187.42
11	GOOGL190719C00960000	2019-06-11 10:13AM EDT	960.00	142.30
12	GOOGL190719C00965000	2019-06-13 10:13AM EDT	965.00	131.30
13	GOOGL190719C00970000	2019-06-26 3:40PM EDT	970.00	113.30
14	GOOGL190719C00975000	2019-06-10 11:46AM EDT	975.00	125.70
15	GOOGL190719C00980000	2019-06-26 1:33PM EDT	980.00	99.80
16	GOOGL190719C00990000	2019-06-26 3:04PM EDT	990.00	91.80
17	GOOGL190719C00995000	2019-06-25 2:36PM EDT	995.00	97.60
18	GOOGL190719C01000000	2019-07-12 2:50PM EDT	1,000.00	146.00
19	GOOGL190719C01010000	2019-07-03 11:01AM EDT	1,010.00	116.95
20	GOOGL190719C01020000	2019-07-05 3:59PM EDT	1,020.00	114.52
21	GOOGL190719C01030000	2019-07-11 3:51PM EDT	1,030.00	115.95
22	GOOGL190719C01040000	2019-07-08 10:42AM EDT	1,040.00	79.20
23	GOOGL190719C01050000	2019-07-15 2:30PM EDT	1,050.00	98.40
24	GOOGL190719C01060000	2019-07-15 9:30AM EDT	1,060.00	86.95
25	GOOGL190719C01070000	2019-07-15 11:08AM EDT	1,070.00	76.62
26	GOOGL190719C01080000	2019-07-15 3:59PM EDT	1,080.00	70.80
27	GOOGL190719C01085000	2019-07-15 1:54PM EDT	1,085.00	61.80
28	GOOGL190719C01090000	2019-07-15 3:43PM EDT	1,090.00	60.00
29	GOOGL190719C01095000	2019-07-15 3:54PM EDT	1,095.00	55.40
..
76	GOOGL190719C01290000	2019-06-18 12:49PM EDT	1,290.00	0.30
77	GOOGL190719C01295000	2019-06-06 2:08PM EDT	1,295.00	0.18
78	GOOGL190719C01300000	2019-07-09 10:24AM EDT	1,300.00	0.05
79	GOOGL190719C01305000	2019-07-01 10:38AM EDT	1,305.00	0.10
80	GOOGL190719C01310000	2019-07-01 11:26AM EDT	1,310.00	0.05
81	GOOGL190719C01315000	2019-06-27 3:40PM EDT	1,315.00	0.13
82	GOOGL190719C01320000	2019-07-05 12:41PM EDT	1,320.00	0.09
83	GOOGL190719C01325000	2019-07-02 11:17AM EDT	1,325.00	0.12
84	GOOGL190719C01330000	2019-06-07 3:56PM EDT	1,330.00	0.10
85	GOOGL190719C01335000	2019-06-07 11:24AM EDT	1,335.00	1.50
86	GOOGL190719C01340000	2019-07-12 10:49AM EDT	1,340.00	0.08
87	GOOGL190719C01345000	2019-07-02 10:47AM EDT	1,345.00	0.05
88	GOOGL190719C01350000	2019-06-07 11:24AM EDT	1,350.00	0.20
89	GOOGL190719C01360000	2019-06-06 9:45AM EDT	1,360.00	0.23
90	GOOGL190719C01370000	2019-06-28 3:37PM EDT	1,370.00	0.10

91	GOOGL190719C01380000	2019-06-21 11:01AM EDT	1,380.00	0.05
92	GOOGL190719C01400000	2019-07-02 3:06PM EDT	1,400.00	0.05
93	GOOGL190719C01420000	2019-06-07 11:24AM EDT	1,420.00	0.55
94	GOOGL190719C01440000	2019-06-19 12:34PM EDT	1,440.00	0.05
95	GOOGL190719C01460000	2019-06-07 11:24AM EDT	1,460.00	0.42
96	GOOGL190719C01480000	2019-06-26 9:38AM EDT	1,480.00	0.05
97	GOOGL190719C01500000	2019-06-11 10:55AM EDT	1,500.00	0.05
98	GOOGL190719C01520000	2019-05-21 1:53PM EDT	1,520.00	0.10
99	GOOGL190719C01540000	2019-06-21 9:30AM EDT	1,540.00	0.05
100	GOOGL190719C01580000	2019-05-21 1:53PM EDT	1,580.00	0.05
101	GOOGL190719C01700000	2019-06-07 11:24AM EDT	1,700.00	0.05
102	GOOGL190719C01740000	2019-06-07 11:24AM EDT	1,740.00	0.15
103	GOOGL190719C01800000	2019-06-07 11:24AM EDT	1,800.00	0.10
104	GOOGL190719C01820000	2019-06-12 11:23AM EDT	1,820.00	0.04
105	GOOGL190719C01860000	2019-06-07 11:24AM EDT	1,860.00	0.05

	Bid	Ask	Change	% Change	Volume	Open	Interest	Implied Volatility
0	545.50	554.80	0.00	-	-		3	309.72%
1	345.50	354.70	0.00	-	1		1	186.82%
2	295.50	304.80	0.00	-	6		6	161.30%
3	261.00	270.20	0.00	-	8		18	0.00%
4	245.50	254.90	0.00	-	16		25	136.66%
5	209.10	219.00	0.00	-	3		3	0.00%
6	220.50	229.80	0.00	-	1		1	123.62%
7	199.00	208.50	0.00	-	-		5	0.00%
8	184.00	193.40	0.00	-	-		10	0.00%
9	195.50	205.00	0.00	-	37		36	112.63%
10	174.00	183.40	0.00	-	-		7	0.00%
11	180.70	189.60	0.00	-	1		1	0.00%
12	172.70	181.50	0.00	-	1		9	0.00%
13	175.60	185.40	0.00	-	4		5	105.08%
14	156.30	164.50	0.00	-	1		11	0.00%
15	165.50	174.80	0.00	-	2		4	96.98%
16	155.50	164.90	0.00	-	10		18	92.72%
17	150.60	160.40	0.00	-	3		6	92.83%
18	146.40	151.60	0.00	-	21		169	65.48%
19	135.50	144.80	0.00	-	12		26	82.63%
20	125.60	135.30	0.00	-	5		33	80.15%
21	116.00	125.50	0.00	-	3		175	76.14%
22	105.60	115.00	0.00	-	2		107	69.12%
23	96.70	101.70	+2.70	+2.82%	3		359	46.81%
24	86.70	91.70	+0.76	+0.88%	2		270	42.86%
25	77.80	81.80	+0.04	+0.05%	1		177	39.55%
26	68.80	71.70	+3.50	+5.20%	32		757	34.86%
27	63.30	66.90	+0.50	+0.82%	9		192	34.02%
28	58.70	61.80	+3.60	+6.38%	32		310	31.38%
29	54.00	56.90	+3.73	+7.22%	18		341	29.85%

...
76	0.00	0.25	0.00	-	6	129	43.16%
77	0.00	0.10	0.00	-	2	51	39.75%
78	0.00	0.05	0.00	-	1	425	38.09%
79	0.00	0.20	0.00	-	4	17	45.61%
80	0.00	0.20	0.00	-	5	113	46.78%
81	0.00	0.20	0.00	-	1	27	48.00%
82	0.00	0.15	0.00	-	1	35	47.51%
83	0.00	0.10	0.00	-	5	82	46.48%
84	0.00	0.15	0.00	-	3	29	49.81%
85	0.00	0.25	0.00	-	5	14	54.15%
86	0.00	0.20	0.00	-	1	31	53.81%
87	0.00	0.20	0.00	-	5	52	50.88%
88	0.00	0.25	0.00	-	-	1	53.13%
89	0.00	0.25	0.00	-	1	120	55.37%
90	0.00	0.05	0.00	-	1	1	52.34%
91	0.00	0.05	0.00	-	2	169	51.17%
92	0.00	0.05	0.00	-	4	129	54.69%
93	0.00	0.20	0.00	-	3	95	66.21%
94	0.00	0.15	0.00	-	1	11	68.16%
95	0.05	0.20	0.00	-	16	30	75.59%
96	0.00	0.15	0.00	-	3	35	75.59%
97	0.00	0.10	0.00	-	8	122	76.37%
98	0.00	0.25	0.00	-	200	400	86.91%
99	0.00	0.10	0.00	-	1	45	83.20%
100	0.00	0.25	0.00	-	4	6	97.46%
101	0.00	0.10	0.00	-	1	13	108.20%
102	0.00	0.05	0.00	-	1	53	107.81%
103	0.00	0.15	0.00	-	5	35	126.56%
104	0.00	0.05	0.00	-	10	11	118.75%
105	0.00	0.15	0.00	-	30	30	134.77%

[106 rows x 11 columns]

[]: