Plotting Results

March 18, 2018

Generate OHLC chart using matplotlib.finance

```
In [86]: #libraries
         from matplotlib.finance import candlestick_ohlc, candlestick2_ohlc
         %pylab inline
         save = True
```

```
Populating the interactive namespace from numpy and matplotlib
```

Import data:

- open_: open price of the day;
- high_: highest price of the day;
- low_: lowest price of the day;
- close_: close price of the day;
- vix: volatility index.

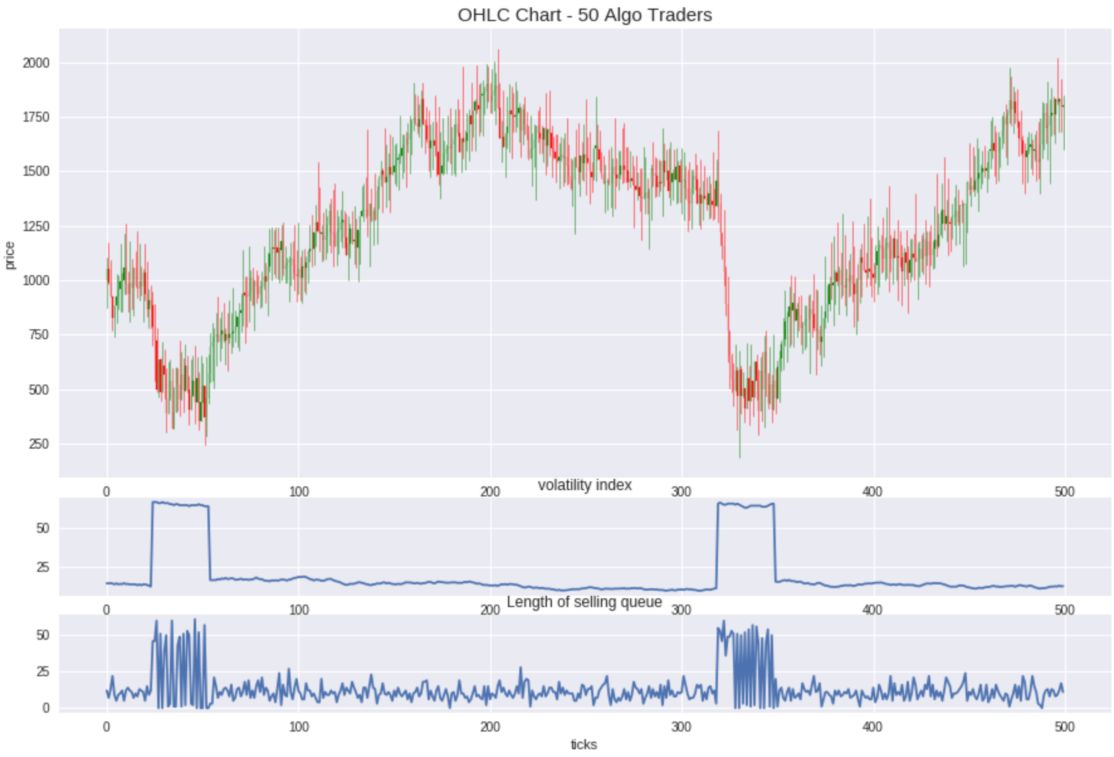
0.1 50 AlgoTraders

```
In [87]: nAlgoTraders = 50
         fh = open('./prices'+str(nAlgoTraders)+'algoTraders.txt')
         open_ = []
         high_ = []
         low_ = []
         close_ = []
         vix = []
         logS = []
         for line in fh:
             s = line.strip().split(',')
             if s[0] != 'open':
                 open_.append(round(float(s[0]),2))
                 high_.append(round(float(s[1]),2))
                 low_.append(round(float(s[2]),2))
                 close_.append(round(float(s[3]),2))
```

```
        vix.append(float(s[4]))
        logS.append(float(s[6]))
fh.close()
date = [i for i in range(len(open_))]
ohlc = []
for i in range(len(open_)):
    append_me = [date[i], open_[i], high_[i], low_[i], close_[i]]
    ohlc.append(append_me)
```

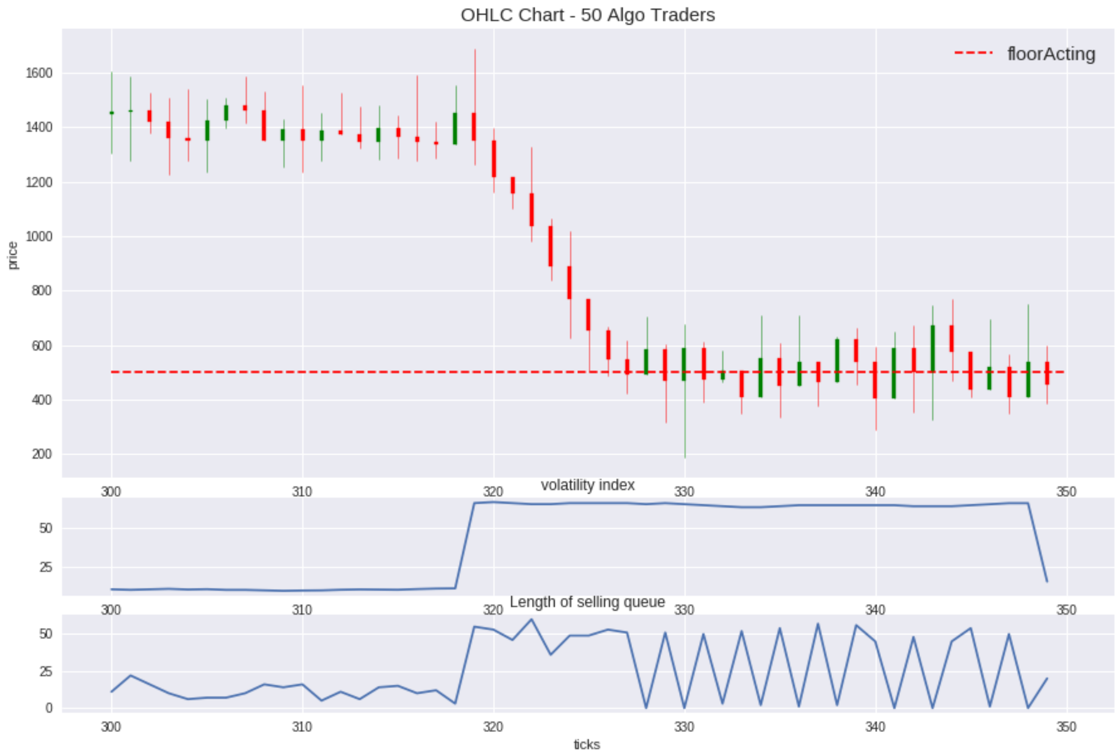
Plot prices in a *ohlc chart* and the evolution of the volatility index:

```
In [88]: style.use('seaborn')
         plt.figure(figsize=(15,10))
         ax1 = plt.subplot2grid((6,1), (0,0), rowspan=4, colspan=1, ylabel='price')
         ax2 = plt.subplot2grid((6,1), (4,0), rowspan=1, colspan=1, sharex=ax1,  xlabel='ticks')
         ax3 = plt.subplot2grid((6,1), (5,0), rowspan=1, colspan=1, sharex=ax1,  xlabel='ticks')
         candlestick_ohlc(ax1, ohlc, colorup = 'g')
         ax1.set_title('OHLC Chart - '+str(nAlgoTraders)+' Algo Traders', size=15)
         ax2.plot(vix)
         ax2.set_title('volatility index')
         ax3.plot(logS)
         ax3.set_title('Length of selling queue')
         if save:
             savefig(str(nAlgoTraders)+'AlgoTraders.png')
```



Focus on bubble explosion part:

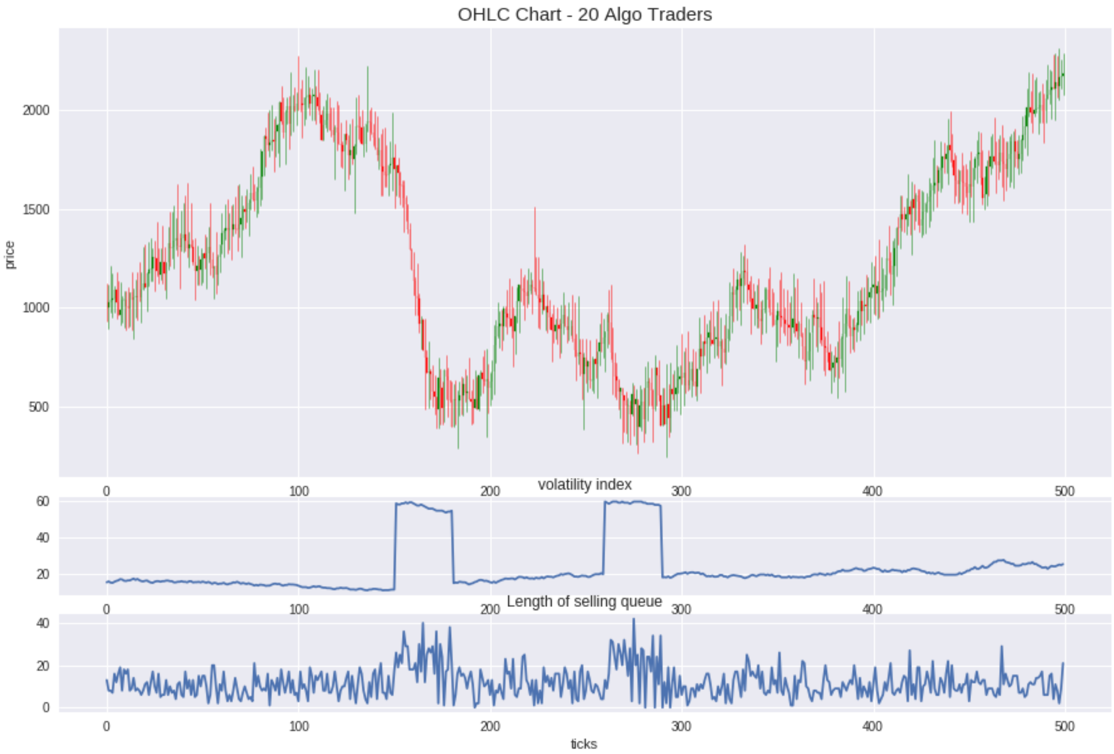
```
In [89]: start = 300
         end = 350
         ohlc_bubble = ohlc[start:end]
         i = start
         for el in ohlc_bubble:
             el[0] = i
             i += 1

         style.use('seaborn')
         plt.figure(figsize=(15,10))
         ax1 = plt.subplot2grid((6,1), (0,0), rowspan=4, colspan=1, ylabel='price')
         ax2 = plt.subplot2grid((6,1), (4,0), rowspan=1, colspan=1, sharex=ax1,  xlabel='ticks')
         ax3 = plt.subplot2grid((6,1), (5,0), rowspan=1, colspan=1, sharex=ax1,  xlabel='ticks')
         candlestick_ohlc(ax1, ohlc_bubble, colorup = 'g')
         ax1.set_title('OHLC Chart - '+str(nAlgoTraders)+' Algo Traders', size=15)
         ax1.hlines(500, start, end, color = 'red', linestyle = '--', label = 'floorActing')
         ax1.legend(fontsize =15)
         ax2.plot(arange(start,end),vix[start:end])
         ax2.set_title('volatility index')
         ax3.plot(arange(start,end),logS[start:end])
         ax3.set_title('Length of selling queue')
         if save:
             savefig(str(nAlgoTraders)+'AlgoTradersBubble.png')
```



0.2 20 AlgoTraders

```
In [90]: nAlgoTraders = 20
         fh = open('./prices'+str(nAlgoTraders)+'algoTraders.txt')
         open_ = []
         high_ = []
         low_ = []
         close_ = []
         vix = []
         logS = []
         for line in fh:
             s = line.strip().split(',')
             if s[0] != 'open':
                 open_.append(round(float(s[0]),2))
                 high_.append(round(float(s[1]),2))
                 low_.append(round(float(s[2]),2))
                 close_.append(round(float(s[3]),2))
                 vix.append(float(s[4]))
                 logS.append(float(s[6]))
         fh.close()
         date = [i for i in range(len(open_))]
         ohlc = []
         for i in range(len(open_)):
             append_me = [date[i], open_[i], high_[i], low_[i], close_[i]]
             ohlc.append(append_me)
```

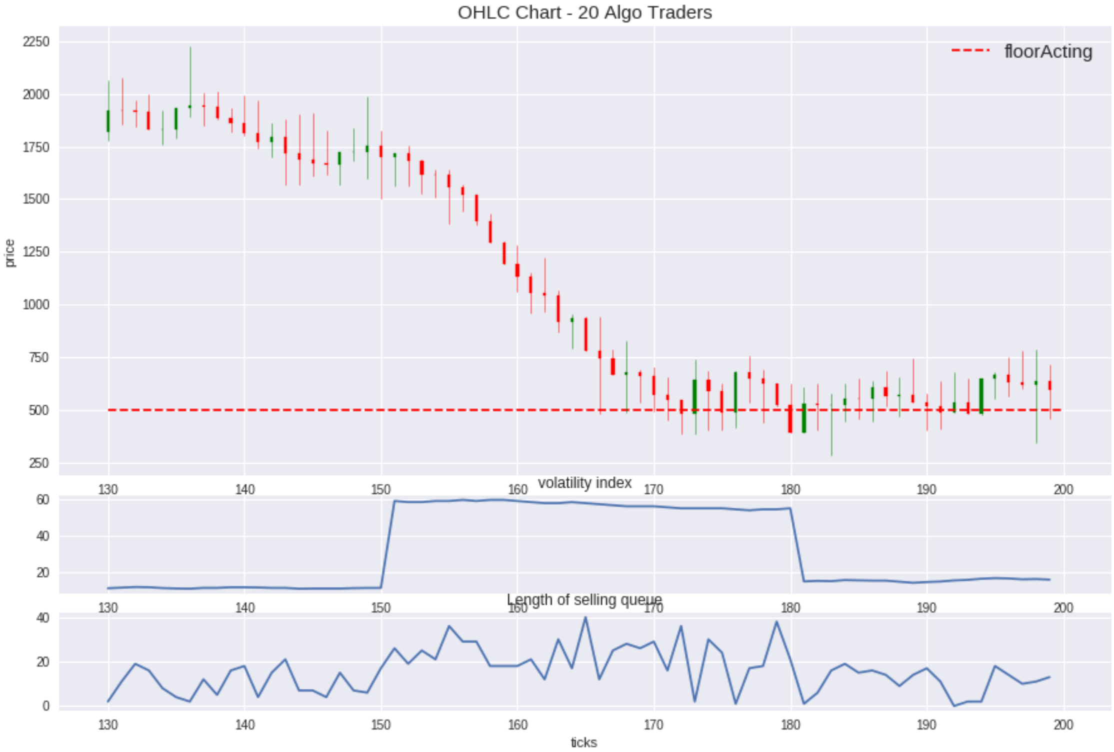
```
In [91]: style.use('seaborn')
         plt.figure(figsize=(15,10))
         ax1 = plt.subplot2grid((6,1), (0,0), rowspan=4, colspan=1, ylabel='price')
         ax2 = plt.subplot2grid((6,1), (4,0), rowspan=1, colspan=1, sharex=ax1,  xlabel='ticks')
         ax3 = plt.subplot2grid((6,1), (5,0), rowspan=1, colspan=1, sharex=ax1,  xlabel='ticks')
         candlestick_ohlc(ax1, ohlc, colorup = 'g')
         ax1.set_title('OHLC Chart - '+str(nAlgoTraders)+' Algo Traders', size=15)
         ax2.plot(vix)
         ax2.set_title('volatility index')
         ax3.plot(logS)
         ax3.set_title('Length of selling queue')
         if save:
             savefig(str(nAlgoTraders)+'AlgoTraders.png')
```



Focus on bubble explosion part:

```
In [92]: start = 130
         end = 200
         ohlc_bubble = ohlc[start:end]
         i = start
         for el in ohlc_bubble:
             el[0] = i
             i += 1

         style.use('seaborn')
         plt.figure(figsize=(15,10))
         ax1 = plt.subplot2grid((6,1), (0,0), rowspan=4, colspan=1, ylabel='price')
         ax2 = plt.subplot2grid((6,1), (4,0), rowspan=1, colspan=1, sharex=ax1,  xlabel='ticks')
         ax3 = plt.subplot2grid((6,1), (5,0), rowspan=1, colspan=1, sharex=ax1,  xlabel='ticks')
         candlestick_ohlc(ax1, ohlc_bubble, colorup = 'g')
         ax1.set_title('OHLC Chart - '+str(nAlgoTraders)+' Algo Traders', size=15)
         ax1.hlines(500, start, end, color = 'red', linestyle = '--', label = 'floorActing')
         ax1.legend(fontsize =15)
         ax2.plot(arange(start,end),vix[start:end])
         ax2.set_title('volatility index')
         ax3.plot(arange(start,end),logS[start:end])
         ax3.set_title('Length of selling queue')
         if save:
```

```
    savefig(str(nAlgoTraders)+'AlgoTradersBubble.png')
```

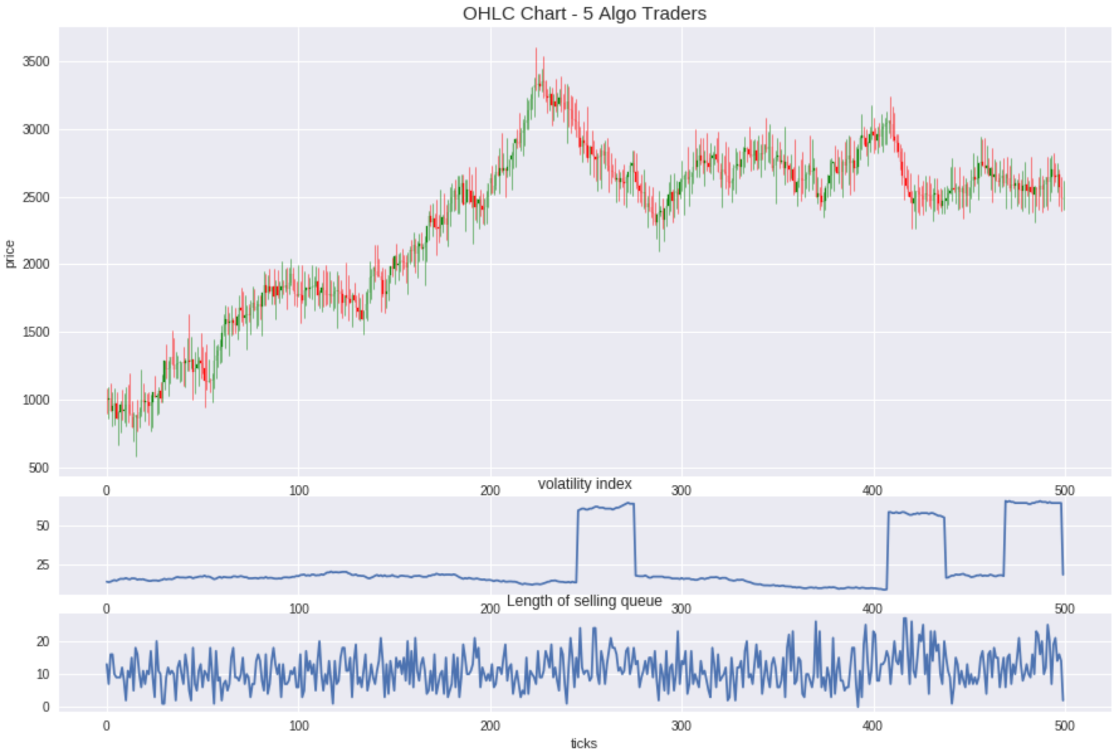


0.3 5 AlgoTraders

```
In [93]: nAlgoTraders = 5
         fh = open('./prices'+str(nAlgoTraders)+'algoTraders.txt')
         open_ = []
         high_ = []
         low_ = []
         close_ = []
         vix = []
         logS = []
         for line in fh:
             s = line.strip().split(',')
             if s[0] != 'open':
                 open_.append(round(float(s[0]),2))
                 high_.append(round(float(s[1]),2))
                 low_.append(round(float(s[2]),2))
                 close_.append(round(float(s[3]),2))
                 vix.append(float(s[4]))
                 logS.append(float(s[6]))
         fh.close()
         date = [i for i in range(len(open_))]
```

```
ohlc = []
for i in range(len(open_)):
    append_me = [date[i], open_[i], high_[i], low_[i], close_[i]]
    ohlc.append(append_me)
```

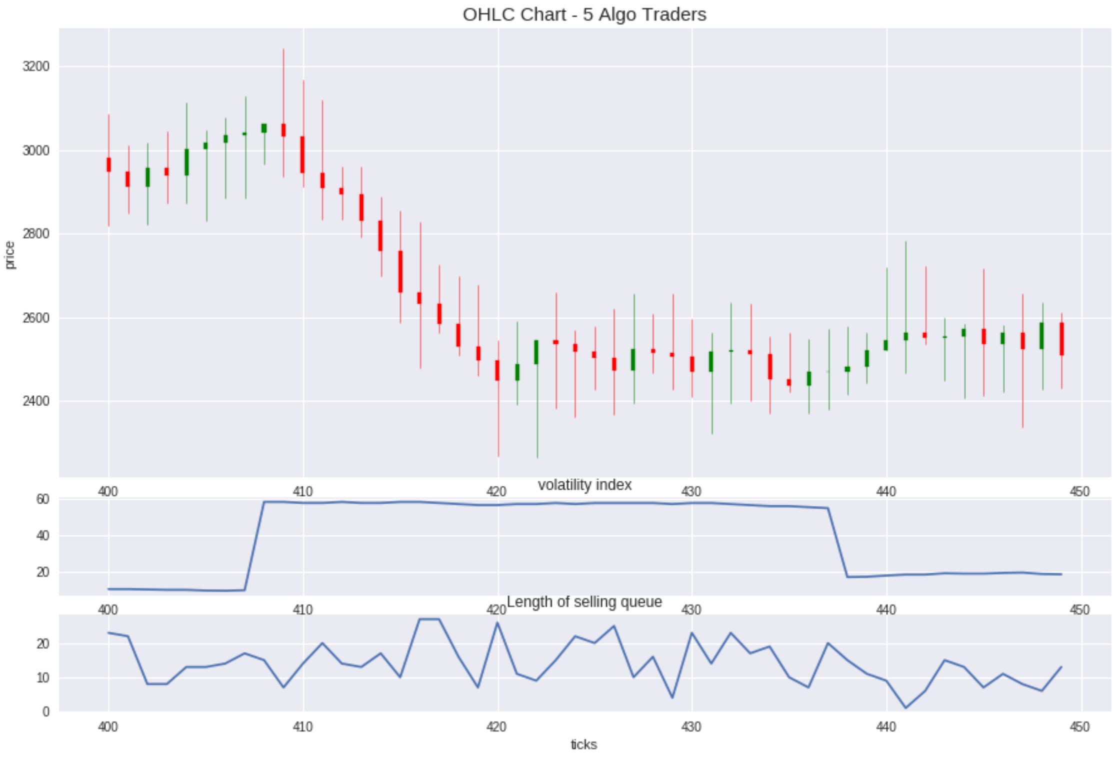
```
In [94]: style.use('seaborn')
         plt.figure(figsize=(15,10))
         ax1 = plt.subplot2grid((6,1), (0,0), rowspan=4, colspan=1, ylabel='price')
         ax2 = plt.subplot2grid((6,1), (4,0), rowspan=1, colspan=1, sharex=ax1,  xlabel='ticks')
         ax3 = plt.subplot2grid((6,1), (5,0), rowspan=1, colspan=1, sharex=ax1,  xlabel='ticks')
         candlestick_ohlc(ax1, ohlc, colorup = 'g')
         ax1.set_title('OHLC Chart - '+str(nAlgoTraders)+' Algo Traders', size=15)
         ax2.plot(vix)
         ax2.set_title('volatility index')
         ax3.plot(logS)
         ax3.set_title('Length of selling queue')
         if save:
             savefig(str(nAlgoTraders)+'AlgoTraders.png')
```



Focus on bubble explosion part:

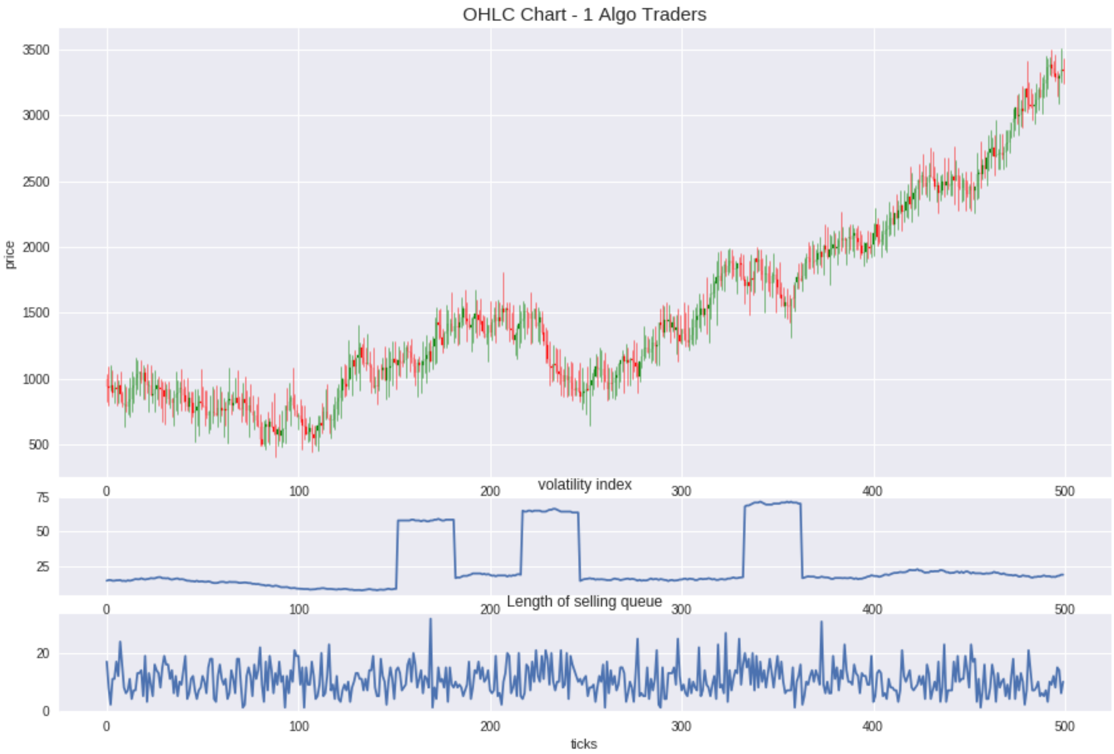
```
In [95]: start = 400
         end = 450
         ohlc_bubble = ohlc[start:end]
```

```
        i = start
        for el in ohlc_bubble:
            el[0] = i
            i += 1

        style.use('seaborn')
        plt.figure(figsize=(15,10))
        ax1 = plt.subplot2grid((6,1), (0,0), rowspan=4, colspan=1, ylabel='price')
        ax2 = plt.subplot2grid((6,1), (4,0), rowspan=1, colspan=1, sharex=ax1,  xlabel='ticks')
        ax3 = plt.subplot2grid((6,1), (5,0), rowspan=1, colspan=1, sharex=ax1,  xlabel='ticks')
        candlestick_ohlc(ax1, ohlc_bubble, colorup = 'g')
        ax1.set_title('OHLC Chart - '+str(nAlgoTraders)+' Algo Traders', size=15)
        ax2.plot(arange(start,end),vix[start:end])
        ax2.set_title('volatility index')
        ax3.plot(arange(start,end),logS[start:end])
        ax3.set_title('Length of selling queue')
        if save:
            savefig(str(nAlgoTraders)+'AlgoTradersBubble.png')
```



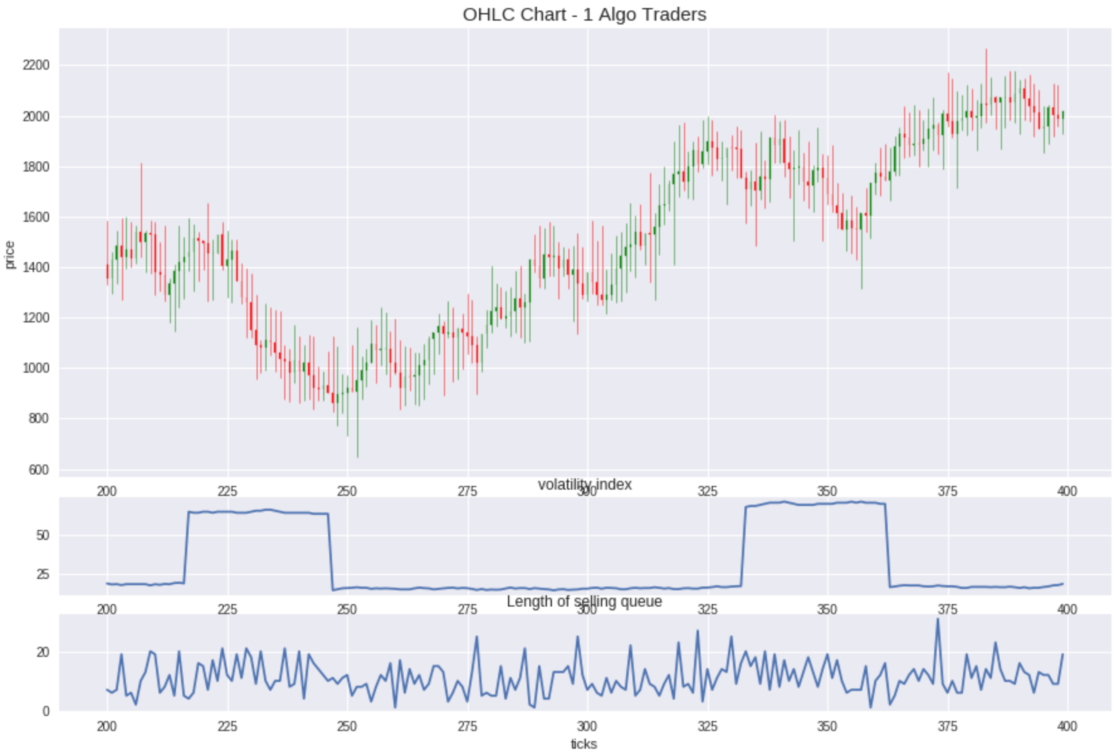
0.4 1 AlgoTrader

```
In [96]: nAlgoTraders = 1
         fh = open('./prices'+str(nAlgoTraders)+'algoTraders.txt')
         open_ = []
         high_ = []
         low_ = []
         close_ = []
         vix = []
         logS = []
         for line in fh:
             s = line.strip().split(',')
             if s[0] != 'open':
                 open_.append(round(float(s[0]),2))
                 high_.append(round(float(s[1]),2))
                 low_.append(round(float(s[2]),2))
                 close_.append(round(float(s[3]),2))
                 vix.append(float(s[4]))
                 logS.append(float(s[6]))
         fh.close()
         date = [i for i in range(len(open_))]
         ohlc = []
         for i in range(len(open_)):
             append_me = [date[i], open_[i], high_[i], low_[i], close_[i]]
             ohlc.append(append_me)

In [97]: style.use('seaborn')
         plt.figure(figsize=(15,10))
         ax1 = plt.subplot2grid((6,1), (0,0), rowspan=4, colspan=1, ylabel='price')
         ax2 = plt.subplot2grid((6,1), (4,0), rowspan=1, colspan=1, sharex=ax1,  xlabel='ticks')
         ax3 = plt.subplot2grid((6,1), (5,0), rowspan=1, colspan=1, sharex=ax1,  xlabel='ticks')
         candlestick_ohlc(ax1, ohlc, colorup = 'g')
         ax1.set_title('OHLC Chart - '+str(nAlgoTraders)+' Algo Traders', size=15)
         ax2.plot(vix)
         ax2.set_title('volatility index')
         ax3.plot(logS)
         ax3.set_title('Length of selling queue')
         if save:
             savefig(str(nAlgoTraders)+'AlgoTraders.png')
```



Focus on bubble explosion part:

```
In [98]: start = 200
         end = 400
         ohlc_bubble = ohlc[start:end]
         i = start
         for el in ohlc_bubble:
             el[0] = i
             i += 1

         style.use('seaborn')
         plt.figure(figsize=(15,10))
         ax1 = plt.subplot2grid((6,1), (0,0), rowspan=4, colspan=1, ylabel='price')
         ax2 = plt.subplot2grid((6,1), (4,0), rowspan=1, colspan=1, sharex=ax1,  xlabel='ticks')
         ax3 = plt.subplot2grid((6,1), (5,0), rowspan=1, colspan=1, sharex=ax1,  xlabel='ticks')
         candlestick_ohlc(ax1, ohlc_bubble, colorup = 'g')
         ax1.set_title('OHLC Chart - '+str(nAlgoTraders)+' Algo Traders', size=15)
         ax2.plot(arange(start,end),vix[start:end])
         ax2.set_title('volatility index')
         ax3.plot(arange(start,end),logS[start:end])
         ax3.set_title('Length of selling queue')
         if save:
             savefig(str(nAlgoTraders)+'AlgoTradersBubble.png')
```


OHLC Chart - 1 Algo Traders
price
2200
2000
1800
1600
1400
1200
1000
800
600
200
225
250
275
300
325
350
375
400
volatility index
50
25
Length of selling queue
20
0
ticks