**The result of runs rate of AAPL\_Nasdaq20120103**

I just choose the time point of 16:00 to check the runs rate because the number of trades are not very big at that moment.

There are the original data below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| mtime | xcomment | side | price | shares |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 16:00:00 | - | S | 411.36 | 500 |
| 16:00:00 | A | S | 410.91 | 6 |
| 16:00:00 | E | S | 410.91 | 6 |
| 16:00:00 | A | B | 410.92 | 1794 |
| 16:00:00 | - | B | 410.58 | 100 |
| 16:00:00 | - | B | 410.83 | 100 |
| 16:00:00 | E | B | 410.92 | 21 |
| 16:00:00 | - | B | 410.66 | 100 |
| 16:00:00 | - | S | 411.05 | 100 |
| 16:00:00 | - | B | 410.56 | 100 |
| 16:00:00 | - | S | 411.14 | 100 |
| 16:00:00 | - | S | 411.24 | 100 |
| 16:00:00 | E | S | 410.93 | 1300 |
| 16:00:00 | A | S | 411.01 | 100 |
| 16:00:00 | E | S | 411.01 | 100 |
| 16:00:00 | D | B | 410.92 | 1773 |
| 16:00:00 | D | S | 411.01 | 100 |
| 16:00:00 | A | B | 411 | 1773 |
| 16:00:00 | P | S | 411.01 | 116 |
| 16:00:00 | A | S | 411.01 | 100 |
| 16:00:00 | E | S | 411.01 | 100 |
| 16:00:00 | D | B | 411 | 1773 |
| 16:00:00 | P | S | 411.01 | 84 |
| 16:00:00 | A | B | 411.04 | 1689 |
| 16:00:00 | E | S | 411.05 | 100 |
| 16:00:00 | E | B | 411.04 | 100 |
| 16:00:00 | D | B | 411.04 | 1589 |
| 16:00:00 | A | B | 411.07 | 1589 |
| 16:00:00 | P | S | 411.09 | 100 |
| 16:00:00 | E | S | 411.1 | 100 |
| 16:00:00 | A | B | 411.07 | 100 |
| 16:00:00 | E | S | 411.1 | 90 |
| 16:00:00 | E | S | 411.1 | 10 |
| 16:00:00 | A | S | 411.1 | 100 |
| 16:00:00 | E | S | 411.1 | 90 |
| 16:00:00 | E | S | 411.1 | 10 |
| 16:00:00 | A | S | 411.1 | 100 |
| 16:00:00 | E | S | 411.1 | 90 |
| 16:00:00 | E | S | 411.1 | 100 |
| 16:00:00 | P | S | 411.1 | 300 |
| 16:00:00 | E | S | 411.11 | 100 |
| 16:00:00 | E | S | 411.11 | 710 |
| 16:00:00 | D | B | 411.07 | 1589 |
| 16:00:00 | A | B | 411.09 | 1589 |
| 16:00:00 | - | B | 411.07 | 100 |
| 16:00:00 | - | B | 409.25 | 100 |
| 16:00:00 | - | S | 411.23 | 100 |
| 16:00:00 | A | B | 411.09 | 100 |
| 16:00:00 | E | B | 411.09 | 460 |
| 16:00:00 | E | B | 411.09 | 480 |
| 16:00:00 | E | B | 411.09 | 600 |
| 16:00:00 | E | B | 411.09 | 49 |
| 16:00:00 | E | B | 411.09 | 100 |
| 16:00:00 | P | B | 411.09 | 331 |
| 16:00:00 | A | B | 411.09 | 100 |
| 16:00:00 | E | B | 411.09 | 100 |
| 16:00:00 | A | B | 411.09 | 100 |
| 16:00:00 | - | S | 450.45 | 3400 |
| 16:00:00 | D | B | 411.09 | 100 |
| 16:00:00 | - | B | 410.31 | 300 |
| 16:00:00 | - | B | 410.71 | 300 |
| 16:00:00 | A | B | 410.93 | 100 |
| 16:00:00 | - | S | 413.31 | 4000 |
| 16:00:00 | - | S | 413.41 | 4000 |

And the total nonzero execution trades at 16:00 are below.

Nonzero means not counting the trades when the price are same.

mtime xcomment side price shares

2012-01-03 16:00:00, E, S, 410.91, 6

2012-01-03 16:00:00, E, B, 410.92, 21

2012-01-03 16:00:00, E, S, 410.93, 1300

2012-01-03 16:00:00, E, S, 411.01, 100

2012-01-03 16:00:00, E, S, 411.05, 100

2012-01-03 16:00:00, E, B, 411.04, 100

2012-01-03 16:00:00, P, S, 411.09, 100

2012-01-03 16:00:00, E, S, 411.1, 100

2012-01-03 16:00:00, E, S, 411.11, 100

2012-01-03 16:00:00, E, B, 411.09, 460

So we can get the conclusion when 16:00 the total nonzero execution trades are 10. And the first run is from 410.91 to 411.05. The second run is from 411.05 to 411.04. The third run is from 411.04 to 411.11 and the last run is from 411.11 to 411.09. So there are 4 runs in total. The runs rate should be 4/10 = 0.4.

And there is my program result below:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| mtime | cancel\_rate | nonezero\_runs | nonezero\_execution | runs\_rate | var | skew | kurt |
| 2012/1/3 16:00 | 0.09375 | 4 | 10 | 0.4 | 0.003634 | -1.50752 | 1.21453 |

AS same as we draw the conclusion above.