

E4729 Algorithm Trading – Group Assignment 1

- Due Feb 28 by 11:59pm
- Points 20
- Submitting a file upload
- Available Feb 19 at 12am - Feb 28 at 11:59pm 10 days

Please answer the following questions. Some will be multiple choice and some will be require you to access data and perform some basic analysis. For questions where numerical or graphical output are required, submit your code and output results as a python notebook. I should be able to easily run your code against the data to reproduce your results.

1. (2 point) Tatonement is:
 - a) a special form of continuous trading
 - b) an iterative series of auctions.
 - c) an example of a dealer market
2. (2 point) The largest components of transaction costs are:
 - a) Commissions, Fees and Taxes
 - b) Spreads and Price Appreciation
 - c) Market Impact, Timing Risk and Opportunity Cost
3. (6 points) Given the following order book, and new orders, show the order state of the order book and any trades that are generated after each order arrives. If a trade does not occur note "no trade". The starting point for each question is the cumulative order book from the previous question.

Bid Quantity	Bid Price	Ask Price	Ask Quantity
2000	22.20	22.21	1200
1800	22.19	22.25	2300
1000	22.16	22.26	1000
1200	22.15	22.30	2000

4.
 - a) A new order arrives to Buy 1000 shares at \$22.20.
 - b) A new order arrives to Sell 1200 shares at \$22.19.
 - c) A new order arrives to Buy 2200 shares at \$22.24.
 - d) A new order arrives to Sell 2000 shares at \$22.19.
 - e) A market order order arrives to buy 3000 shares.
5. (4 points) Using atvi.csv from the data directory, load the data using pandas and selecting the data for September 27, 2019 only:
 - a) calculate the difference between the Open and Close prices in each interval
 - b) calculate the return between each Open and the previous Open. Hint: use the pandas pct_change() function.
 - c) create a chart with four rows of plots: stock price, close - open, % change, volume per interval (as bar).

6. (6 points) Using, atvi.csv from the data directory, load the data using pandas:
- a) using the example code from the class or your own method fit a function to obtain coefficients for a VWAP target function. Show your resulting coefficients.
 - b) run the VWAP target function and plot your resulting cumulative volume function / target curve.
 - c) plot the same VWAP target function as in b) above but also plot the "close" series from September 27, 2019 on the same chart.