Final Project

Course: MTH 9871   Instructor: Beat Ammon

Date: December 4, 2025   Due Date: December 16, 2025

The final project is a group project in teams of three[1], and it aims to put together the exercises we have done so far to build a basic options market-making system.

1. Using the pricer, vol-fit, and risk system we have built in previous exercises, build a basic market-making system that sends quotes and simulates trades.

2. The full project is as follows:

   (a) Use the OPRA snapshots on dropbox: opra snapshots.

   (b) Choose an underlier and an expiry with an expiration within the same week.

   (c) You don't have to simulate in true real-time fashion, it is ok to pre-compute all implied vols in a first pass for example, and simulate trading using these theoretical prices in a second pass.

   (d) However, your decisions on how to send quotes are not allowed to use future information.

   (e) You don't have to send quotes in more than the selected expiry, and you can choose the range of options you want to quote (just a few around at-the-money is sufficient, or almost full range if you prefer). Decide on how to set the quote width, for example you can take market-quotes into account.

   (f) Decide on how to simulate trades. You can delta-adjust using the spot for the next quote snapshot before simulating trades if you wish, and you can limit the number of trades to just one or other fixed number per cycle if you prefer limited trades (assuming there is risk-mitigation).

   (g) Manage at least the delta risk by a policy of your choice, optionally vega-risk also using a policy of your choice.

3. It's not a trading competition, it's totally acceptable if your system is not profitable in the backtest. Focus on getting reasonable vol-fits and seeing how well these agree with the market, and how to hedge risk systematically.

4. Reuse code from previous exercises where possible. The code does not have to be very polished or highly optimized, but explain assumptions, and which parts you think would need most work and improvement in a real trading system.

5. Don't hesitate to ask questions!

6. The groups will be announced in the channel.

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[1]two groups of four based on size of class