Strategy Report for LiquiMaker

How I Explored the Dataset

To build a reliable liquidity strategy, I began by analyzing the order book data using pandas. I explored:

- The structure of buy and sell orders over time.
- The tightness of the bid-ask spread.
- How often the best bid and best ask changed.
- The frequency of trade executions near the top of the book.

From this, I learned:

- The market typically operates with a small spread (less than or equal to 4 ticks).
- Trades usually happen at or very close to the best bid or ask.
- Providing liquidity near these levels could be consistently profitable.

What Inspired My Strategy

This strategy was driven by the idea of:

- Acting as a passive liquidity provider rather than a directional trader.
- Capturing the spread by placing limit orders at the best bid and ask.
- Managing inventory to reduce exposure risk.
- Taking advantage of a consistently tight spread in the order book.

The approach focuses on making small profits from market microstructure imbalances rather than predicting price trends.

Core Logic of the Algorithm

The logic behind **LiquiMaker** works as follows:

- Determine the best bid and best ask from the order book.
- Compute the spread.
- If the spread is small (4), we place:
  - A buy order of 10 units at the best bid, if we are below our max long limit.
  - A sell order of 10 units at the best ask, if we are below our max short limit.
- Order sizes are adjusted automatically to prevent exceeding the max position of ± 50 units.

This allows the trader to:

- Passively collect spread profits.
- Stay within risk-managed inventory bounds.
- Exploit frequent spread-closing opportunities with minimal market impact.

Experiments, Variations, and Insights

During development, I tested the following:

- Varying the spread threshold (tested from 2 to 6 ticks).
- Changing order sizes (5, 10, 20 units).
- Experimenting with adaptive order sizes based on proximity to max position.

Insights:

- A 4-tick spread threshold offers a sweet spot — tight enough to ensure execution but wide enough to be profitable.
- A constant order size of 10 is simple and effective, though dynamic sizing may help in volatile markets.
- Staying within position limits is essential — exceeding limits results in directional exposure and risk.

Next Steps

Future enhancements could include:

- Dynamically adjusting order size based on inventory skew.
- Incorporating recent trade history to adjust aggressiveness.
- Adding a volatility estimator to adjust spread thresholds adaptively.