Market Making Strategies Using Nubra Trading API (UAT)

A Comparative Study of Profitability and Risk Control

1. Introduction

Market making is a core function of modern financial markets, providing liquidity by continuously quoting bid and ask prices. A market maker earns profit primarily from the bid–ask spread but is exposed to significant inventory and adverse selection risks.

This project implements and evaluates multiple market-making strategies using real-time order book data from the Nubra Trading API (UAT environment). The objective is to study how progressively adding risk controls—such as inventory awareness and order book imbalance—affects profitability, stability, and inventory exposure.

2. System Architecture

The system is implemented in Python and consists of:
- Market Data Layer
- Order Book Wrapper
- Strategy Engine
- Simulator
- PnL Tracker
- Logging & Visualization

3. Strategy Design

Baseline Strategy:
Fixed spread around mid-price with no risk control.

Inventory-Aware Strategy:
Inventory-based skew to reduce directional exposure.

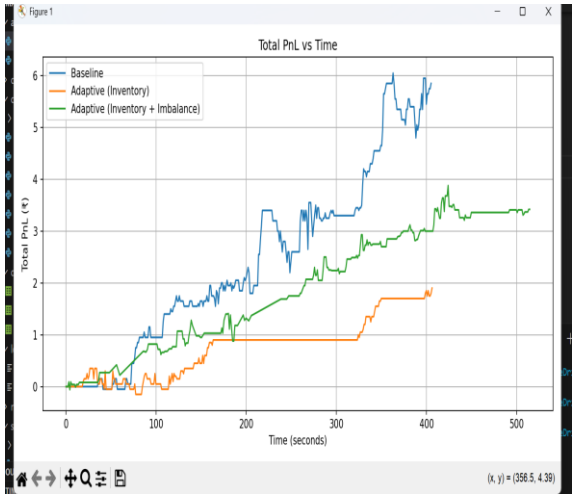
Inventory + Order Book Imbalance Strategy:
Combines inventory control with imbalance-based skew.

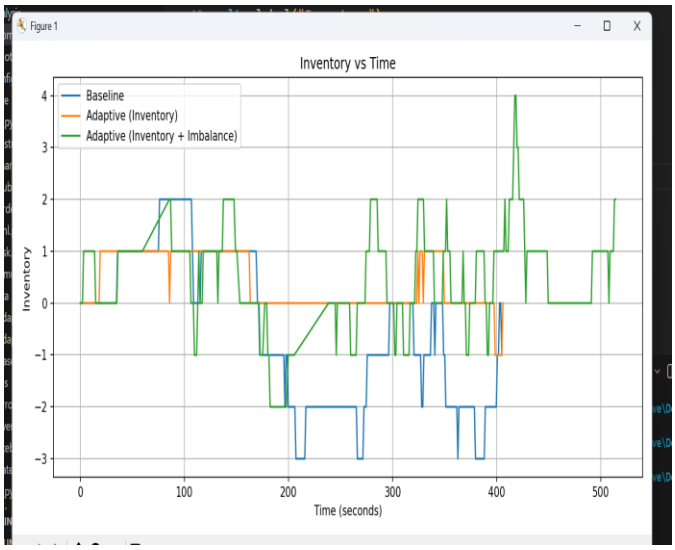
4. Experimental Setup

Instrument: HDFCBANK (NSE)
Environment: Nubra UAT
Execution: Paper Trading

5. Results and Analysis

While the baseline strategy generated higher short-term profits, it accumulated directional inventory. Adaptive strategies reduced inventory variance, leading to improved stability and lower tail risk.





6. Conclusion

Inventory management and order book imbalance improve robustness.
Risk-adjusted returns are critical for sustainable market making.

7. Disclaimer

This project is for educational and research purposes only.

8.Future improvements

Future improvements may include volatility-adjusted spreads, dynamic fill probability modeling, and multi-instrument market making.