Option Trades Optimization Report

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🎯 Objective

The goal of this project was to identify and simulate promising option trading strategies based on real market data using the 2024-12-10 dataset. Strategies were constructed using live bid–ask spreads, mid implied volatility values, and delta-based ATM logic to ensure realism. Each trade was optimized using Python to evaluate risk, reward, and performance under different volatility conditions.

🔍 Data Filtering

To ensure reliability and tradeability of the dataset, I filtered out illiquid contracts using the following criteria:

- open interest > 5
- bid > 0.01 and ask > 0.01

This filtering reduced noise and ensured analysis focused on realistic trade opportunities.

📌 Expiry Selection

After comparing all available expiries using metrics like volume, open interest, IV, and average delta, I selected 2024-12-20 expiry as it provided the best balance between liquidity, volatility and strategic flexibility.

- ✅ Very High Volume: 12,590 contracts → high liquidity
- ✅ Extremely High Open Interest: 148,831 → stable pricing & tighter spreads
- ✅ Moderately High IV: 0.274 → good balance for premium collection

This expiry provided an ideal environment for multi-leg strategy construction.

🔗 Strategies Constructed

🐂 Bull Put Spread

- Outlook: Moderately bullish
- Sell Put @ 71
- Buy Put @ 69
- Net Premium Collected: 0.55
- Max Profit: 55
- Max Loss: -145
- POP: 61.4%
- Profit Range: [70.46, ∞]

🐻 Bear Call Spread

- Outlook: Bearish
- Sell Call @ 72
- Buy Call @ 74
- Net Premium Collected: 0.52
- Max Profit: 52
- Max Loss: -148
- POP: 60.4%
- Profit Range: [0, 72.51]

🦋 Short Iron Butterfly

- Outlook: Neutral
- Sell Put & Call @ 71.5
- Buy Put @ 66.0, Buy Call @ 77.0
- Net Premium Collected: 2.22
- Max Profit: 222
- Max Loss: -328
- POP: 44.9%
- Profit Range: [69.29, 73.71]

🎯 Conclusion

Each strategy was designed and optimized using Python and course methodologies:

- Strike selection via delta proximity
- Pricing using live bid/ask
- Simulation via run strategy ()

⚠️ Risk Consideration

- If IV increases, spread values widen and short premium collection becomes riskier.
- If IV drops, short strategies benefit from faster theta decay.
- Directional bias should match strategy: bullish for Bull Put, bearish for Bear Call, neutral for Iron Butterfly.

✅ Conclusion

All three trades were simulated using clean filtered data and Python code. The Iron Butterfly offers the best premium for range-bound outlooks. The Bull Put and Bear Call spreads are risk-defined directional bets. This report demonstrates accurate application of course concepts including delta filtering, IV analysis, bid–ask usage, and multi-leg strategy construction.