

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: 12,633 contracts → high liquidity
-  Extremely High Open Interest: 169,674 → stable pricing & tighter spreads
-  Moderately High IV: 0.71 → 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.