Data Science Report – Market Sentiment vs Trader Behavior

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1. Overview

This project analyzes the relationship between trader behavior and market sentiment (Fear/Greed) using real trading data from Hyperliquid and the Crypto Fear & Greed Index. The goal is to understand how trading risk, profit, and volume align or diverge from sentiment.

2. Datasets Used

1. Trader Dataset (`historical_data.csv`)

- Columns: Account, Coin, Execution Price, Size, Side, Fee, Closed PnL, Timestamp IST, etc.
- Used to analyze trade volume, profit/loss, and coin-wise performance.

2. Sentiment Dataset (`fear_greed_index.csv`)

- Columns: Date, Classification (Fear / Greed)
- Used to segment trades by market mood.

3. Analysis Performed

- Cleaned and merged both datasets using the `Timestamp IST` and `Date` columns.
- Filtered valid rows with matching dates.
- Calculated:
    - Closed PnL by sentiment
    - Trade Volume by sentiment
    - Avg PnL per coin

4. Key Visuals & Insights

1. **Closed PnL vs Sentiment**
    - Boxplot shows greater variance in profits during **Greed** periods.
    - Losses are slightly more consistent during **Fear**.
2. **Trade Volume vs Sentiment**
    - Higher trading volume during **Greed**, indicating more active risk-taking.
    - During **Fear**, traders reduce volume, possibly waiting for stability.
3. **Top Coins by Average Closed PnL**
    - Coins like `BTC`, `ETH`, and `SOL` show higher average PnL.
    - Some coins may yield negative returns consistently.

5. Conclusion

- Traders tend to take more risks during Greed phases, resulting in higher volume and variance in PnL.
- Analysis like this can help develop better trading strategies aligned with crowd sentiment.
- Further improvements can include modeling risk-adjusted returns and integrating real-time sentiment feeds.