Trader Behavior vs Market Sentiment – Analysis Report
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1. Objective

To explore how trader behavior (PnL, volume, direction, leverage) aligns or diverges from Bitcoin market sentiment (Fear vs Greed), using historical trading data and the Fear & Greed Index.

2. Data Overview

Sentiment Dataset: Contains daily market sentiment labeled as Fear, Greed, etc.

Trader Dataset: Over 200,000 trades from Hyperliquid with metrics like size, direction, execution price, PnL, and time.

3. Key Findings

📊 Average Profitability (Closed PnL)

Average profits were slightly higher during Greed phases, but with more variance during Fear.

Boxplot analysis showed outliers and riskier positions during periods of extreme sentiment.

💸 Trade Volume

Total trade volume in USD was significantly higher during Greed.

Indicates increased activity and confidence from traders in bullish sentiment environments.

🔄 Buy vs Sell Behavior

During Fear, traders showed a higher proportion of Sell orders, indicating risk aversion.

During Greed, Buy orders dominated, consistent with bullish momentum trading.

📈 Leverage Trends (Proxy)

Calculated as Size USD / Start Position, proxy leverage showed higher variance in Greed, possibly due to overconfidence or momentum strategies.

More controlled (lower leverage) observed in Fear, signaling risk mitigation.

📉 PnL Over Time

Time-series analysis of PnL revealed:

Short-term spikes in PnL correlated with Greed phases.

Sustained drawdowns often followed Extreme Fear periods.

4. Insights & Implications

Behavior shifts clearly align with sentiment: Traders tend to be more aggressive in Greed phases and cautious in Fear.

Riskier strategies (higher leverage and volume) are more prevalent during Greed.

Recommendation: Strategies should be adjusted dynamically based on sentiment phases (e.g., risk-off in Fear, risk-on in Greed).

5. Visualizations

Refer to the PNGs in the outputs/ folder:

Closed PnL by Market Sentiment

Trade Volume (USD) by Sentiment

Average PnL by Sentiment

Proxy Leverage by Sentiment

Buy vs Sell