

Trader Behavior vs Market Sentiment – Data Science Assignment

1. Objective

The goal of this analysis was to explore the relationship between trader performance and Bitcoin market sentiment (Fear, Neutral, Greed), identify behavioral patterns, and uncover potential signals to inform smarter trading strategies.

2. Dataset Overview

Two datasets were used: (1) Bitcoin Market Sentiment (2644 rows, 2018–2024) with daily sentiment classification and index values, and (2) Historical Trader Data from Hyperliquid (211,224 trades) including trade size, execution price, PnL, and timestamps.

3. Data Preparation

- Standardized date formats and merged datasets on trade date.
- Normalized sentiment categories to Fear, Neutral, and Greed.
- Removed 6 trades with missing sentiment data.
- Created additional features including win rate, average trade size, and sentiment shift.

4. Key Findings

- **Greed days** had the highest average PnL (~\$53.88) and win rate (42%), while **Fear days** had larger average trade sizes (~\$7.18k).
- **Neutral days** showed lowest profitability (~\$34.31) and smallest win rates.
- Sentiment **value** had negligible correlation with PnL (0.008) or trade size (-0.03), indicating sentiment level alone is not predictive.
- The largest profits occurred after **sentiment shifts**, especially Fear → Greed and Greed → Fear transitions.

5. Visual Insights

Key plots saved in 'outputs/' folder:

- Average PnL by sentiment
- Win rate by sentiment
- Trade size distribution by sentiment
- PnL vs sentiment value scatter plot
- Average PnL by sentiment shift

6. Implications for Trading Strategy

- Traders may achieve higher profits by paying attention to sentiment transitions rather than static sentiment levels.
- Large trade sizes during Fear periods suggest elevated risk-taking behavior, potentially leading to volatility in PnL.
- Neutral → Greed transitions may signal underperformance opportunities for counter-trading

strategies.

7. Conclusion

This analysis shows that while average sentiment levels have weak correlation with trader profitability, shifts in sentiment present strong behavioral signals. Monitoring these shifts could enhance risk management and improve trade timing in volatile crypto markets.