Insights Summary

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Problem Statement

This analysis aims to uncover the relationship between Bitcoin market sentiment—measured via the Fear & Greed Index—and trader performance on the Hyperliquid platform. Specifically, it seeks to:

- Quantify performance metrics (PnL, ROI, Win Rate, Drawdown) across different sentiment regimes: **Extreme Fear**, **Fear**, **Neutral**, **Greed**, and **Extreme Greed**.

- Identify **top-performing**, **consistent**, and **contrarian** traders relative to market mood.

- Enable a sentiment-aware foundation for trader benchmarking, risk management, and strategic signal enhancement.

Analytical Approach

1. Data Preparation

- Parsed and cleaned ~400,000 trade records.
- Integrated daily sentiment scores based on trade timestamps.
- Engineered key features including daily PnL, ROI, holding duration, and trade frequency.

2. Exploratory Data Analysis

- Visualized distributions and variance in PnL and ROI segmented by sentiment regime.
- Explored relationships via correlation matrices and conditional performance histograms.
- Identified initial anomalies and outlier strategies.

3. Advanced Metric Computation

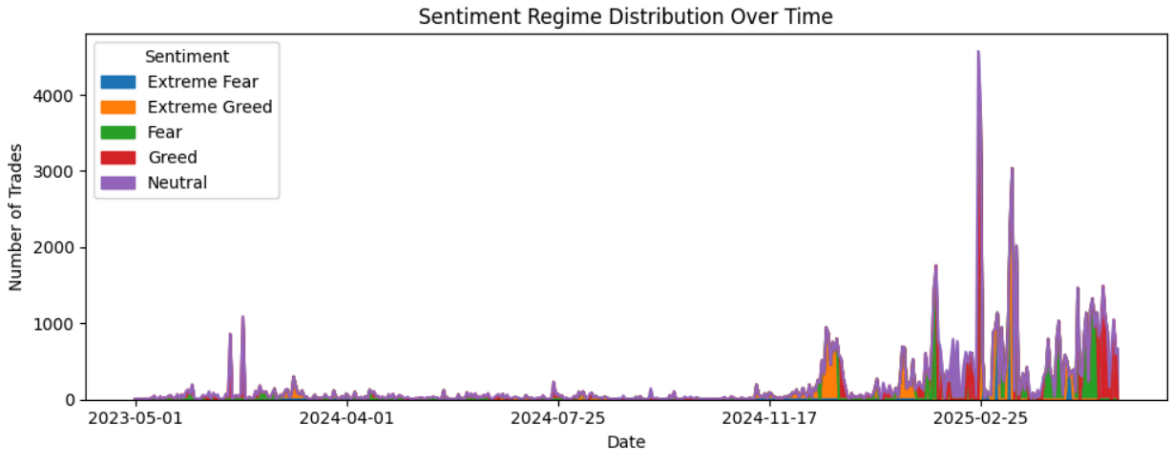
- Derived quantitative risk metrics: **Sharpe Ratio**, **Sortino Ratio**, **Max Drawdown**, and **Profit Factor**.
- Segmented trader performance by sentiment to uncover edge cases.

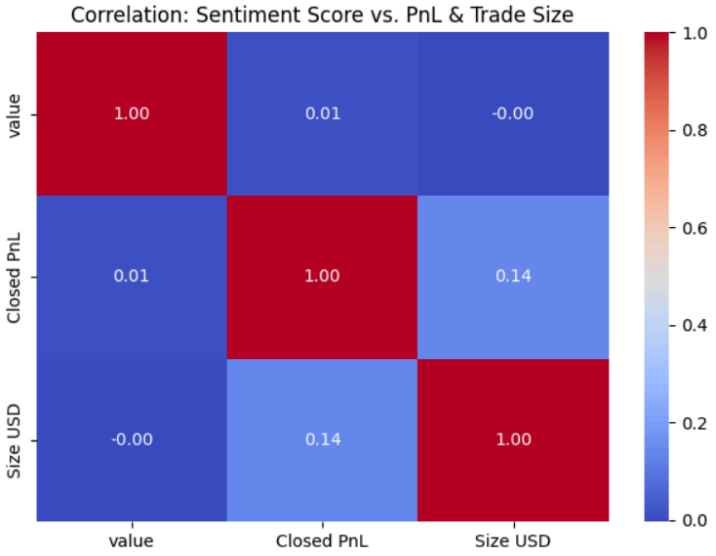
4. Trader Clustering

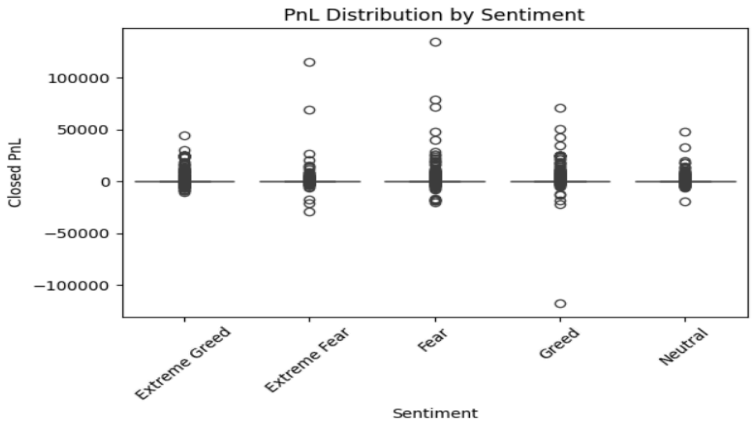
- Applied K-Means clustering to group traders by behavioral archetypes:
    - **Momentum**: Profit during high sentiment.
    - **Contrarian**: Success in fear-driven markets.
    - **Stable**: Consistency with lower volatility.

5. Output Generation

- Generated leaderboards highlighting top traders by regime.
- Exported summary CSVs and accompanying visual plots.







Key Findings

- **Sentiment Correlation**:
    - Moderate positive correlation between sentiment score and ROI ($r \approx 0.32$).
    - Performance volatility spikes during Fear and Extreme Fear phases.
- **Performance Insights**:
    - Greed-based markets reward high-risk momentum strategies (Top Sharpe ≈ 1.8).
    - Fear regimes reveal a resilient subset of contrarian traders with drawdowns < –$2K and win rates > 60%.
    - Stable performers consistently post modest ROI irrespective of regime.
- **Clustering Observations**:
    - Momentum clusters skew toward Greed.
    - Contrarians surface in bearish conditions, ideal for tactical allocations.
    - Stable traders show low standard deviation in returns, ideal for base exposure.

Practical Applications

- **Sentiment-Aligned Allocation**: Strategically allocate capital to traders or strategies that historically outperform in current sentiment regimes.

- **Quantified Risk Evaluation**: Use risk-adjusted performance metrics to establish strategy benchmarks and safeguard capital deployment.

- **Signal Prioritization**: Integrate trader clusters and sentiment-aligned KPIs into algorithmic decision frameworks.

- **Model Features**: Leverage engineered metrics (e.g., Sortino, ROI by sentiment) for supervised or reinforcement learning models.
