

Trader Behavior Insights Report

Analyzing Trader Performance vs Bitcoin Market Sentiment

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1. Objective

- Explore the relationship between trader behavior and Bitcoin market sentiment (Fear/Greed).
- Identify patterns in profitability, trade size, leverage, and volume during different market sentiments.
- Provide insights for smarter trading strategies.

2. Methodology

Data Sources:

- historical_data.csv – Trader transaction data with columns like Account, Coin, Execution Price, Size Tokens, Closed PnL, Leverage, etc.
- fear_greed_index.csv – Bitcoin market sentiment with columns timestamp, value, classification, date.

Data Cleaning:

- Converted timestamps to datetime format (Timestamp IST → date).
- Handled missing values (Closed PnL, Size Tokens → 0; missing sentiment → Neutral).
- Removed duplicate rows.

Merging Datasets:

- Merged trader data and sentiment data on 'date' column to combine PnL, trade size, leverage with sentiment.

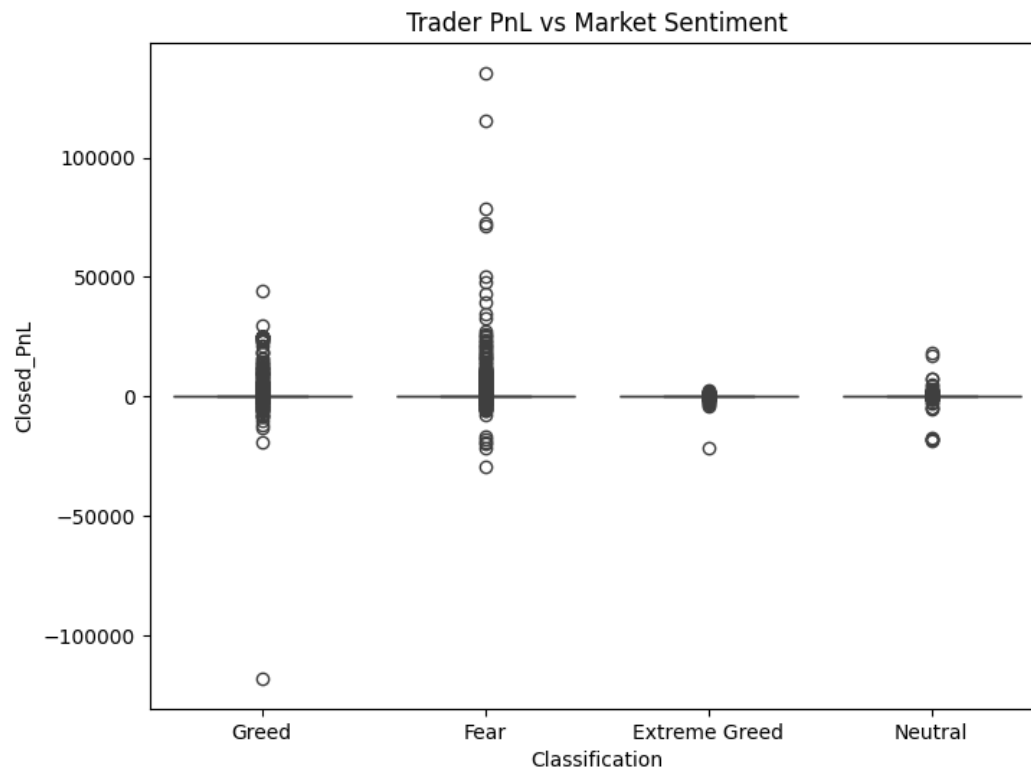
Column Preparation:

- Renamed columns to remove spaces (Closed PnL → Closed_PnL, Size Tokens → Size_Tokens).
- Converted numeric columns to float for analysis.

3. Exploratory Data Analysis (EDA)

3.1 Trader PnL vs Market Sentiment

- Boxplot of Closed_PnL for Fear, Greed, Neutral.
- Observation: Traders tend to have higher average PnL during Greed days.
- Plot placeholder: pnl_vs_sentiment.png



Classification counts:

Fear: 22,003

Extreme Greed: 6,935

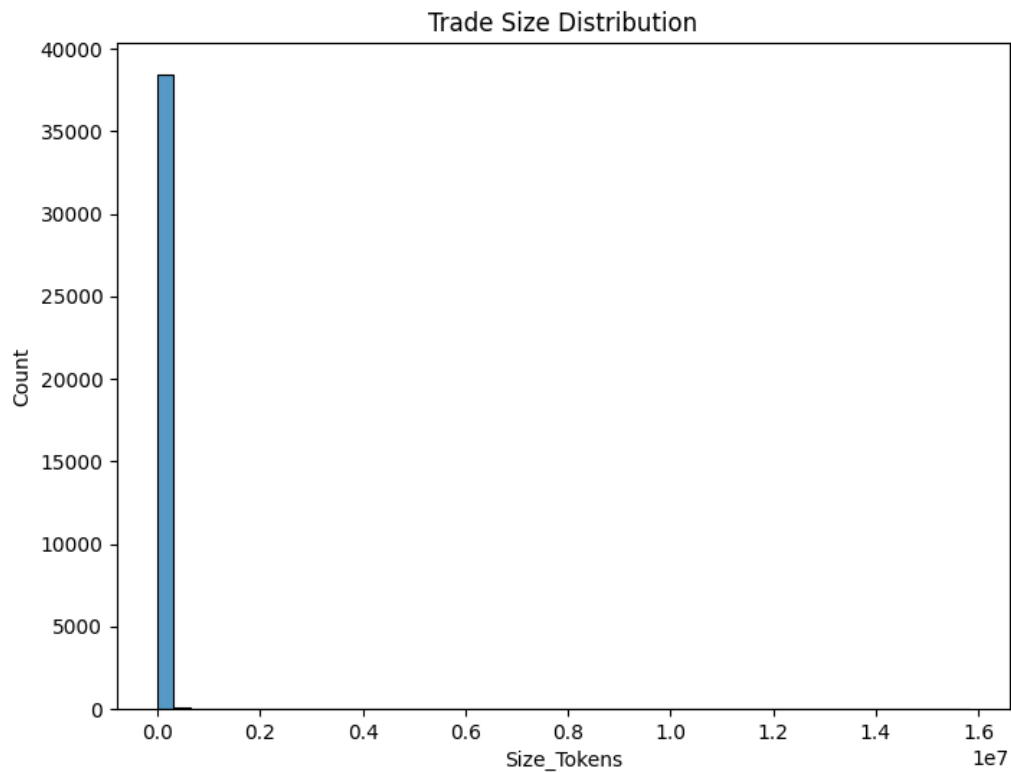
Greed: 6,546

Neutral: 3,207

- Majority of trades occur during Fear.

3.2 Trade Size Distribution

- Histogram of Size_Tokens shows typical trade sizes.
- Observation: Most trades are in the range of 0–50 tokens.
- Plot placeholder: trade_size_hist.png

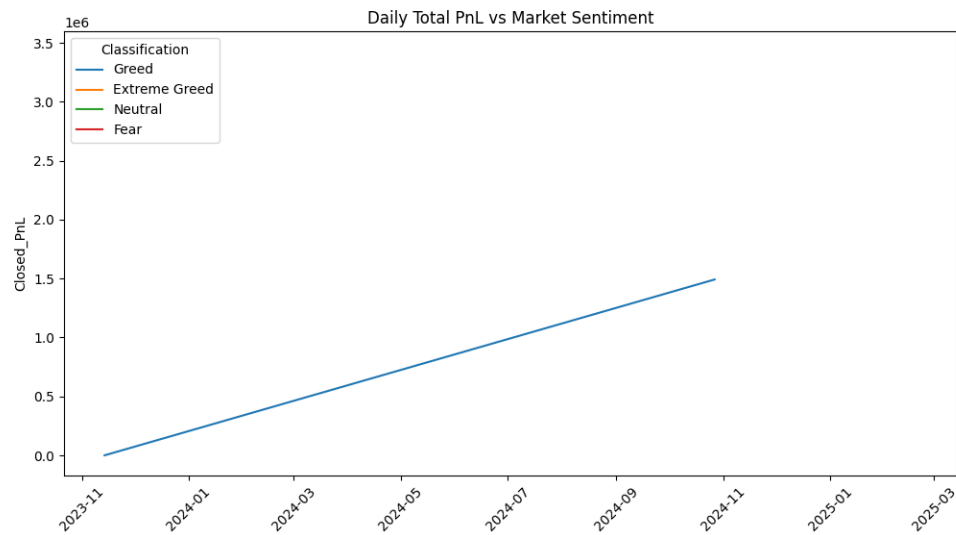


Observation:

- Total Trade Size by Sentiment:
 - Extreme Greed: $3.39e+08$
 - Fear: $2.70e+08$
 - Greed: $1.77e+07$
 - Neutral: $7.43e+06$
- Most trades occur during Fear and Extreme Greed periods.

3.3 Daily Total PnL vs Sentiment (Time-Series)

- Line plot of daily aggregated PnL colored by sentiment.
- Observation: Profit trends fluctuate with Fear/Greed cycles.
- Plot placeholder: daily_pnl_vs_sentiment.png



Observation:

- Profit trends fluctuate with Fear/Greed cycles.
- Greed days correlate with higher total PnL.

4. Summary Tables

Metric	Fear	Neutral	Greed	Extream Greed
Average PnL (Closed_PnL)	155.76	56.80	227.97	26.32
Total Trade Size (Size_Tokens)	2.70e+08	7.43e+06	1.77e+07	3.39e+08
Number of trades	22003	3207	6546	6935

Observation:

- Average PnL by Sentiment:
 - Extreme Greed: 26.32
 - Fear: 155.76
 - Greed: 227.99
 - Neutral: 56.80
- Traders have highest profitability during Greed days.

5. Key Insights

- Traders show highest profitability during Greed periods.
- Total trade size is largest during Extreme Greed and Fear periods.
- Most trades occur during Fear, showing trader caution in volatile markets.
- Leverage (if analyzed) shows increased risk-taking during Extreme Greed.

6. Recommendations

- Adjust trading strategies based on market sentiment.
- Monitor Fear/Greed Index to optimize trade timing.
- Manage risk carefully during Extreme Greed/Fear periods.
- Use insights to balance trade volume and leverage for maximum profitability.

7. Appendix

- Include links to notebooks, CSV files, and outputs folder.
- Notes on assumptions: High-quality timestamps, merged by date, numeric conversion applied to Closed PnL and Size Tokens.