Title:

Trader Behaviour vs Market Sentiment – Analysis Report

Role / Assignment:

Junior Data Scientist – Trader Behavior Insights

Candidate:

Saloni Jain

Date:

25-11-2025

1.Introduction

In this analysis, I explore how traders' outcomes shift with changes in market sentiment—whether the mood is Fear, Greed, or Neutral. By merging historical trading data with a sentiment index, I study how profitability, trading volume, and win rate behave in different market phases.

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2. Dataset Description

2.1 Trader Dataset

The trader dataset contains detailed execution-level information for trades on Hyperliquid.
Important columns used in this analysis include: Account, Coin, Execution Price, Size USD, Side, Timestamp IST, Start Position, Direction, Closed PnL, Fee, Trade ID.
There is **no leverage column** in the dataset, so leverage-based analysis was not performed.

2.2 Sentiment Dataset

The sentiment dataset contains the Bitcoin Fear & Greed Index over time.
Columns used: Timestamp, value, classification , date.
For the analysis the sentiment labels were simplified to: **Fear** (including Extreme Fear), **Greed** (including *Extreme Greed*), **Neutral.**

Both datasets were merged using the **date** so each trade had the sentiment of that day.

3.Methodology

- Explored data for missing values, outliers, and consistency.
- Merged datasets to label each trade with its daily sentiment.
- Calculated key metrics: average trader PnL, win rate, trading volume for each sentiment phase.
- Visualized findings using bar plots, boxplots, and cumulative time series.

- Added cluster analysis to identify different trader groups and measured how sentiment shifts affect performance.

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4. Key Analysis Results

- **Average Profit (PnL):**
  Greed days consistently brought higher average profits, while Neutral periods performed the worst.
  Takeaway: Traders benefit most during Greed.

- **Win Rate:**
  Slightly higher in Greed, but the gain is small—implying higher profits come from larger/more trades, not better accuracy.

- **Trading Volume:**
  Peaks sharply in Greed, is lowest in Neutral.
  Takeaway: Traders are more active and take bigger positions in Greed.

- **Buy vs Sell Activity:**
  Balanced in Fear/Neutral, but Sell trades rise during Greed—possibly as traders take profits or react to rallies.

- **Clustering (Trader Groups):**
  Using KMeans, I found three types:
  - Safer, steady-volume traders
  - High-volume, aggressive traders
  - Riskier/lower-performing traders
  - *Takeaway:* Account behaviour varies widely and explains differing results within the same sentiment.

- **Sentiment Shifts:**
  Analyzing days where sentiment flipped (e.g., Fear to Greed), I noticed distinct jumps in both trader activity and profits—suggesting quick adaptation to changing moods.

- **Machine Learning Pipeline:**
  I demonstrated a basic sklearn pipeline setup, ready for future prediction tasks (e.g., classifying trader type or predicting PnL from trade attributes).

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5. Conclusion

Trader behaviour and outcomes are closely linked to market mood. Greed phases result in more trading, higher profits, but also higher risk and volatility. Fear phases are more controlled, and Neutral seems least favourable.

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6. Final Note

This analysis gives a basic understanding of how sentiment affects trading behaviour and could be useful for improving strategy and risk decisions.

Insights from such analysis can support more adaptive strategies and risk management, especially in volatile crypto markets.