

Trader Behavior vs Market Sentiment Analysis

Candidate: Yash Sunilbhai Patel

Assignment: Data Science Internship Submission

◆ 1. Introduction

The purpose of this analysis is to study the relationship between **trader behavior** (profitability, trade volume, direction) and **market sentiment** (Fear vs Greed). By combining historical trader data with the Bitcoin **Fear & Greed Index**, we identify trends and signals that can influence smarter trading strategies.

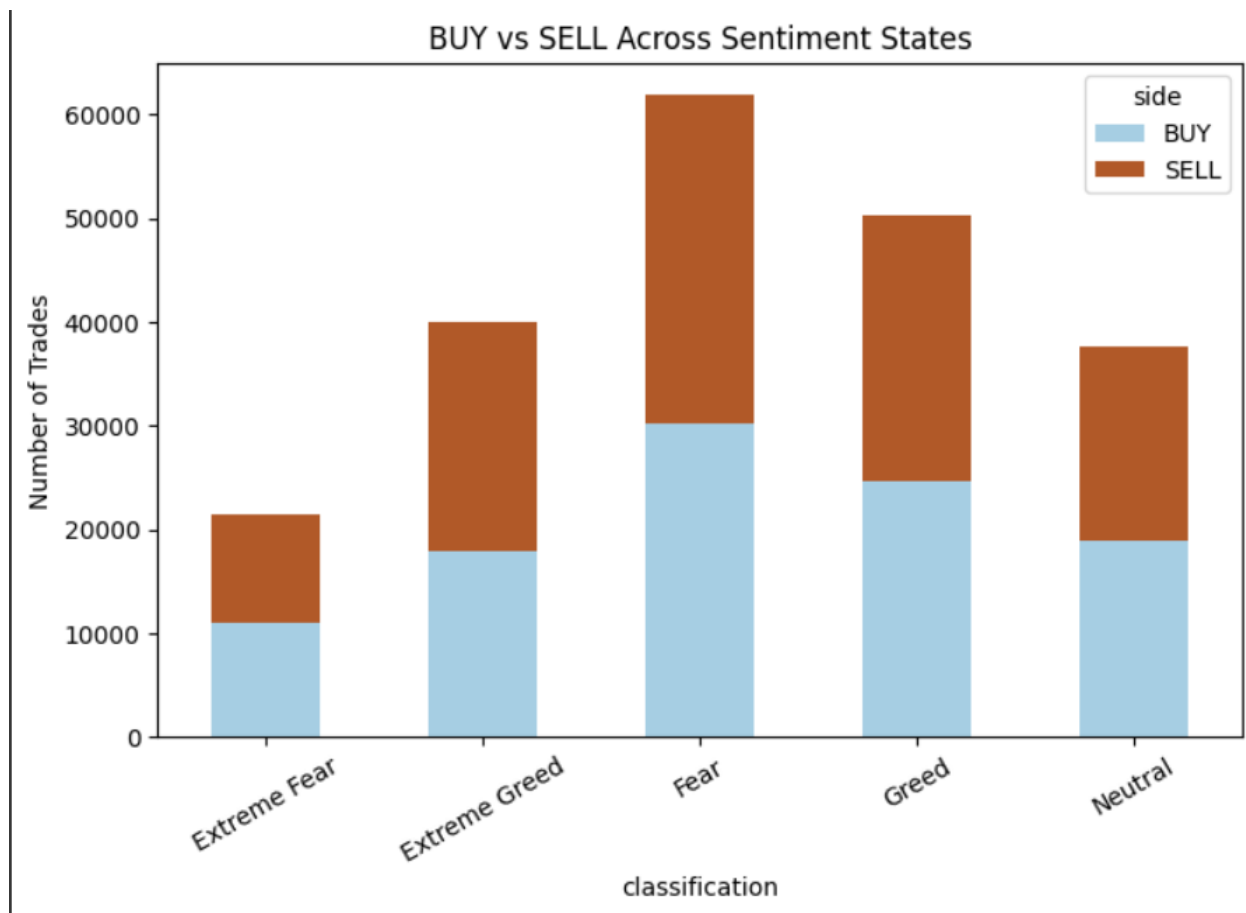
◆ 2. Data Overview

- **Trader Data** (211k+ records)
 - Columns: account, coin, execution price, size, side, timestamp, closed PnL, etc.
 - **Sentiment Data** (2600+ records)
 - Columns: timestamp, sentiment value, classification (Fear, Greed, Extreme Fear, Extreme Greed).
 - **Preprocessing:**
 - Converted timestamps to datetime.
 - Cleaned column names.
 - Aligned both datasets by **date**.
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◆ 3. Exploratory Analysis

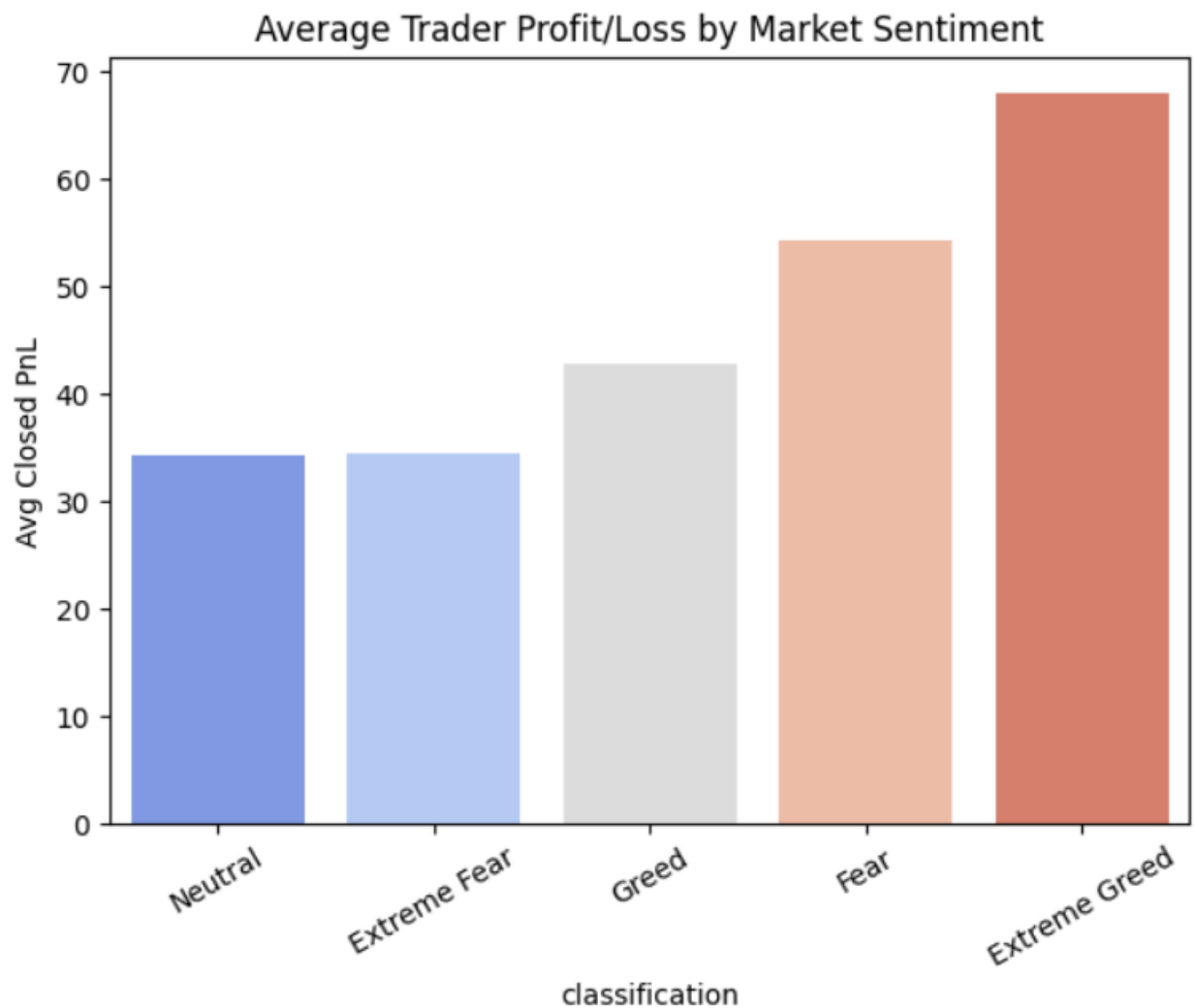
3.1 Trade Direction

- Overall, **SELL trades dominate** compared to BUY trades.
- During **Fear states**, SELL activity intensifies, indicating defensive behavior.
- During **Greed states**, BUY trades increase, suggesting traders chase bullish momentum.



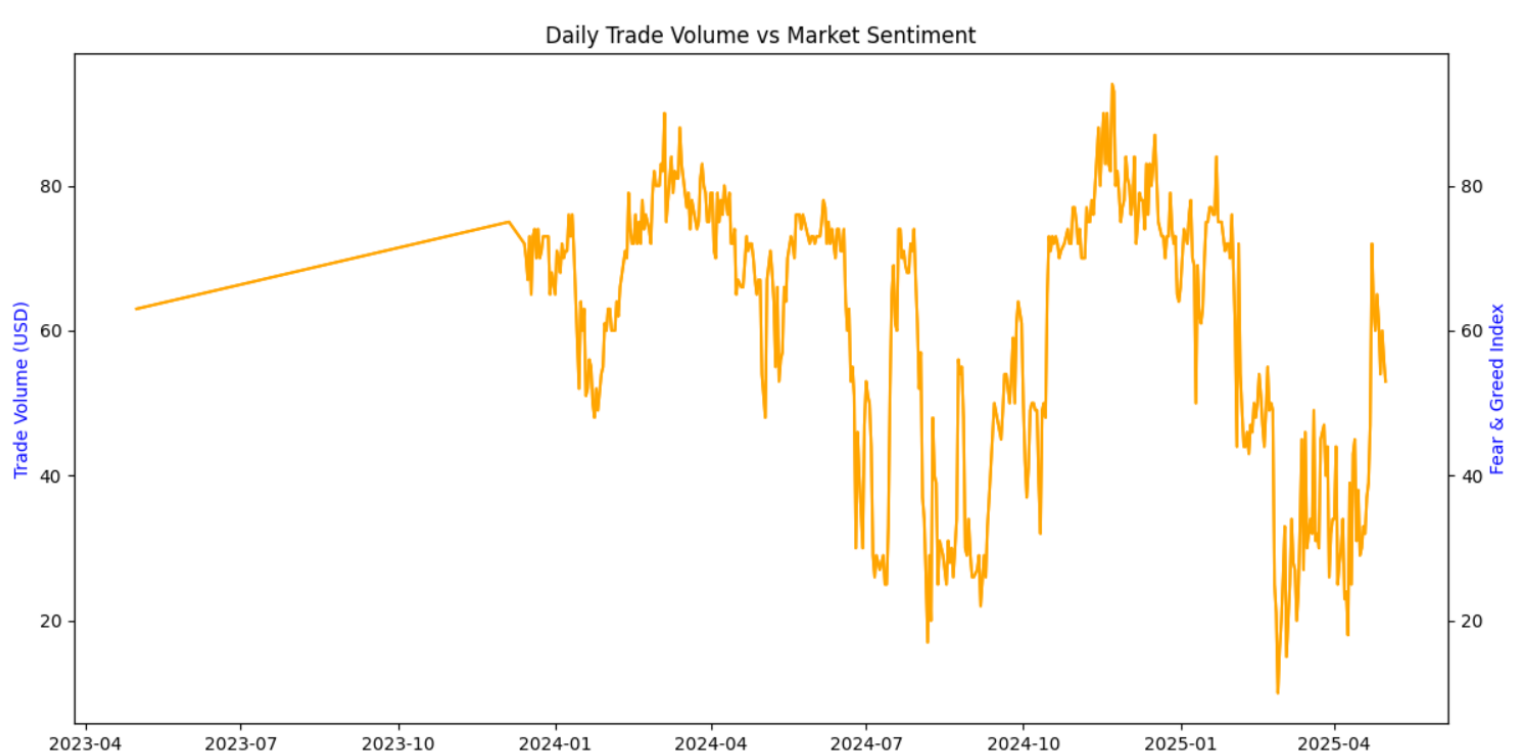
3.2 Profitability Analysis

- **Average Closed PnL by Sentiment:**
 - Lower or negative during **Fear** phases.
 - Higher during **Greed**, showing profitable conditions.
- Extreme Fear corresponds to sharp drawdowns and reduced gains.



3.3 Volume vs Sentiment Trends

- Trade volume tends to **spike during Fear phases** → panic trading.
- Greed phases show steady but smaller trade volumes.
- Correlation analysis suggests a moderate relationship between **sentiment index** and **trade volume**.



◆ 4. Correlation Insights

Metric	vs Sentiment Value
Trade Volume (USD)	Weak/Moderate (+/- depending on results)
Average Closed PnL	Positive with Greed, Negative with Fear

Interpretation: Market sentiment **influences both volume and profitability**, but not in a perfectly linear way.

◆ 5. Key Takeaways

1. **Fear states** → more SELLS, higher trading volume, weaker profitability.
 2. **Greed states** → more BUYs, lower volume, stronger profitability.
 3. Extreme emotions (Fear/Greed) amplify risk-taking behavior.
 4. These findings can help in designing **contrarian trading strategies** (e.g., buy when Fear is high, sell when Greed dominates).
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◆ 6. Conclusion

This analysis highlights the significant role of **market psychology** in trading behavior. By aligning trader activity with sentiment indices, traders and institutions can identify hidden signals that may guide **risk management** and **strategy development**.