

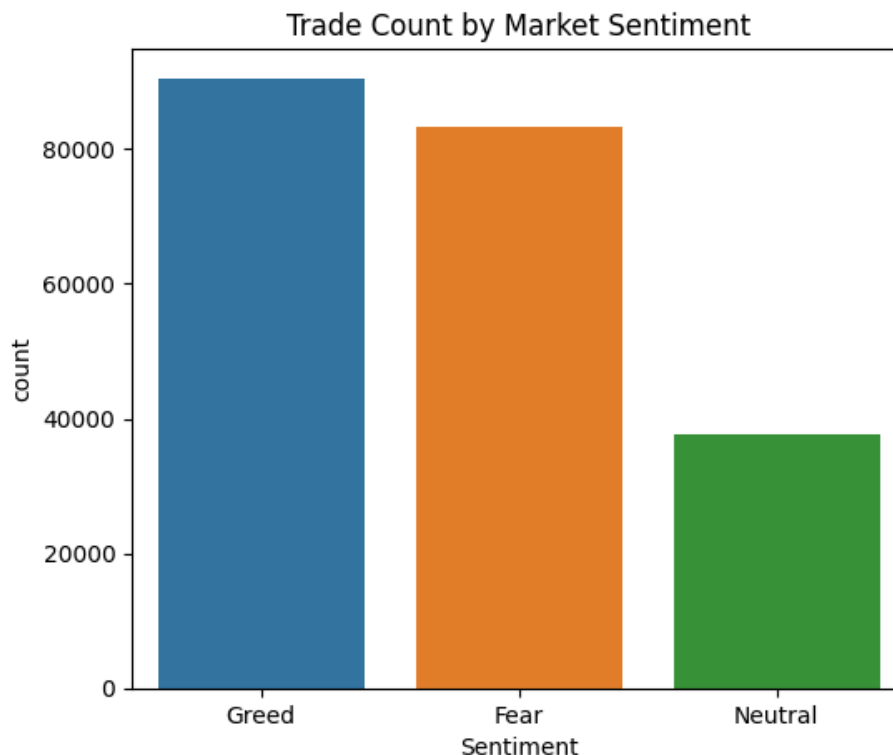
## Data Science Report: Market Sentiment vs Trader Behavior

This analysis explores how trader behavior (profitability, volume, leverage, and risk) aligns with overall market sentiment (Fear, Greed, and Neutral). Using two datasets - one reflecting trader activity and the other capturing Bitcoin market sentiment - we merged them on a date basis to gain insight into how mood influences trading decisions.

### EDA Visualizations:

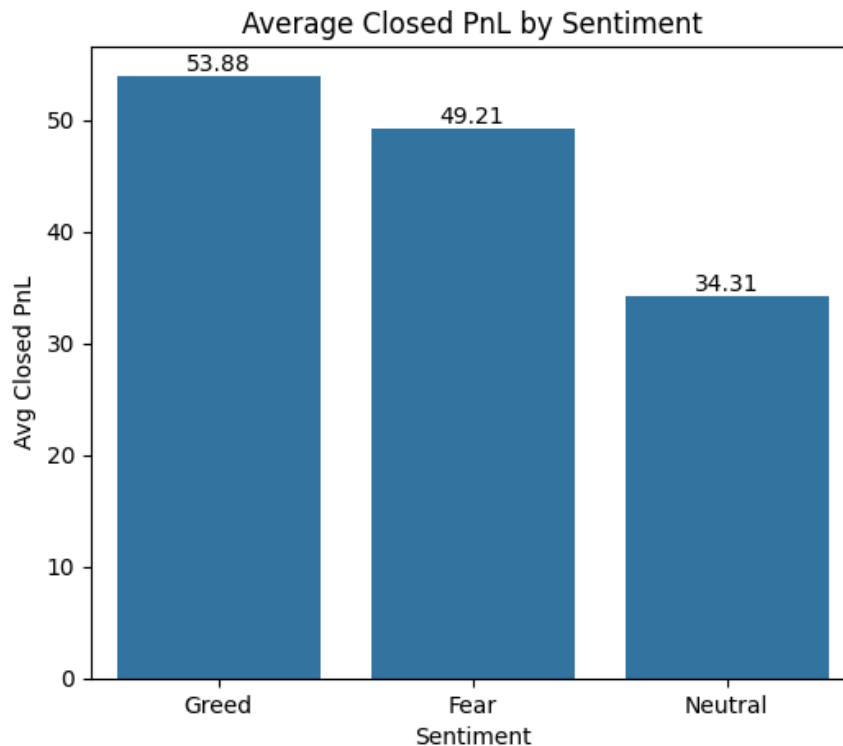
#### 1. Trade Count by Sentiment

- **More trades were executed during periods of "Greed" than "Fear".**
- Indicates traders are **more active and confident** when market sentiment is positive.
- Reflects typical human behavior — optimism leads to more participation.

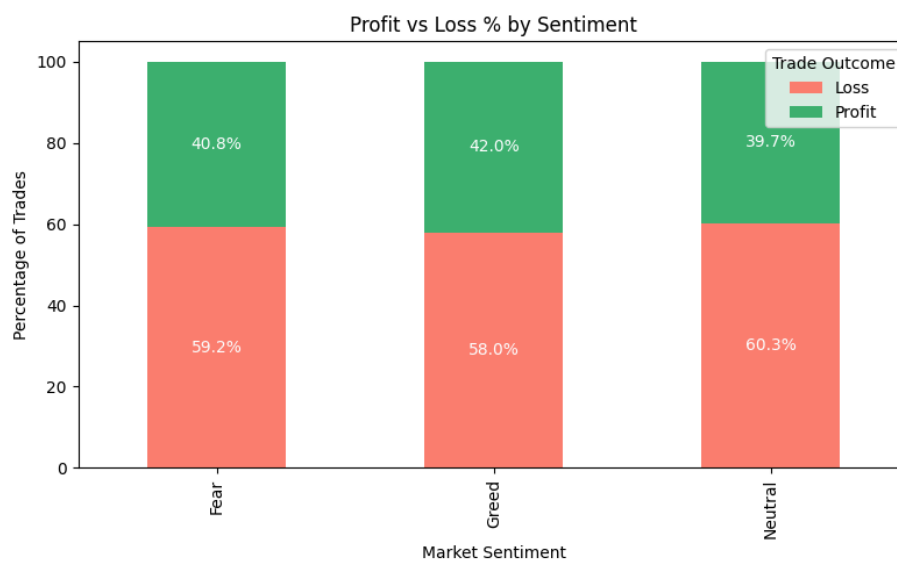


## 2. Average Closed PnL (Profitability)

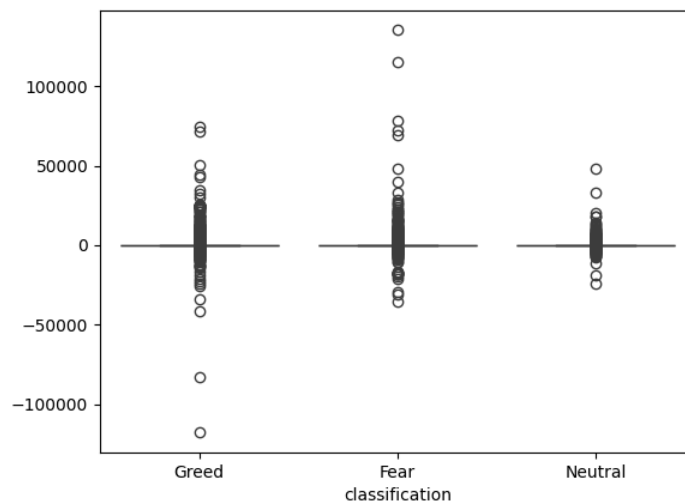
- **Higher average PnL in Greed** than in Fear.
- Indicates **traders are more profitable** when sentiment is optimistic.
- Could imply better market conditions or overconfidence during Greed periods.



## 3. Profit VS Loss by Sentiment

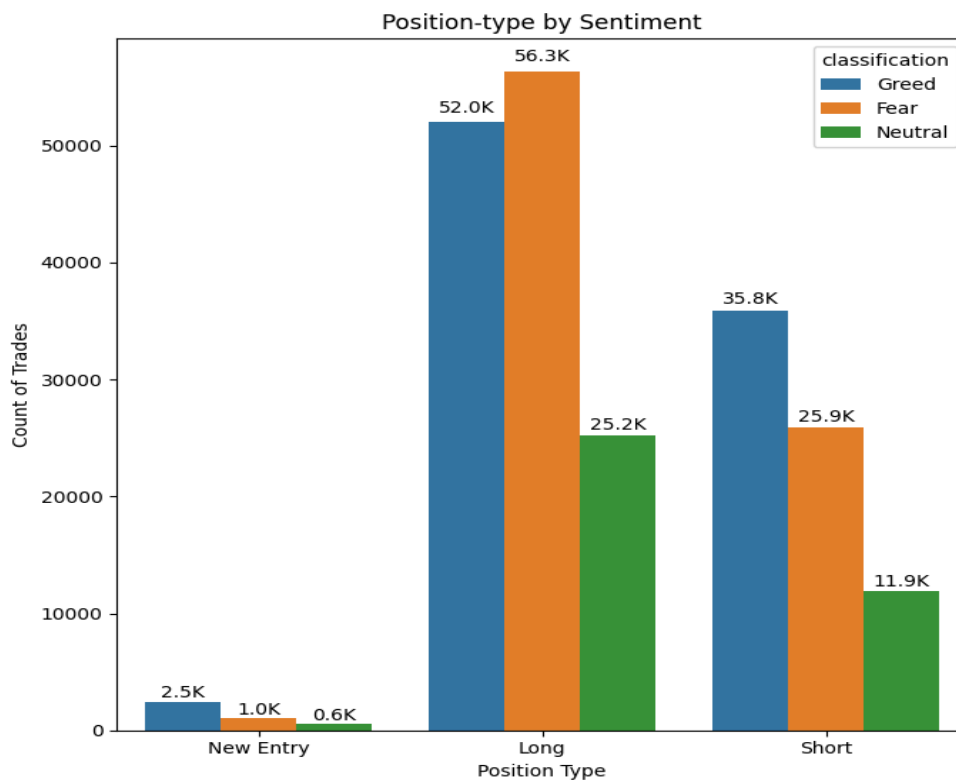


#### 4. Distribution Plot of Closed PnL

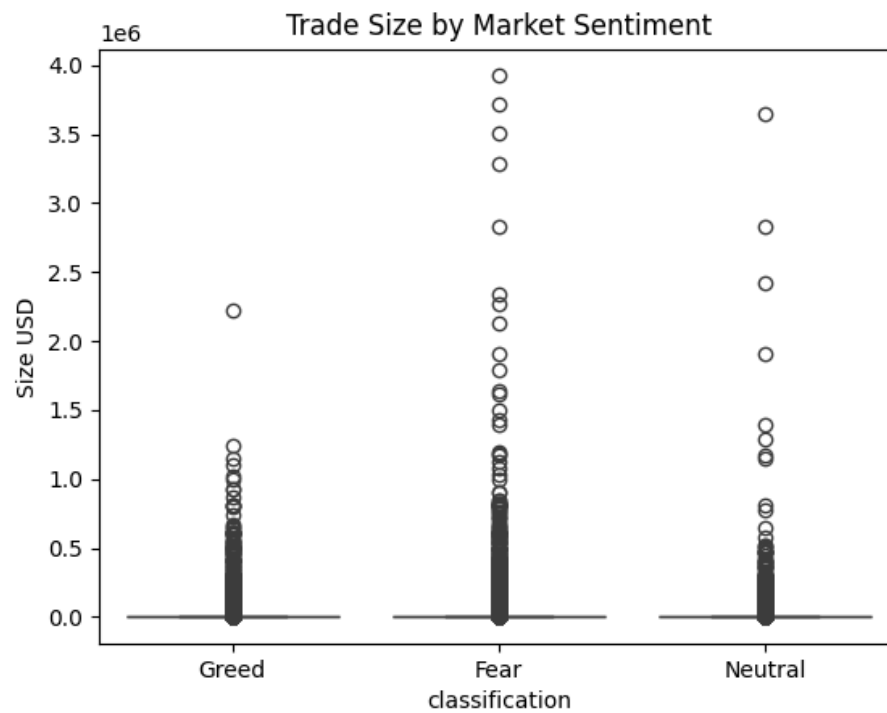


#### 5. Position-type by Sentiment

- During **Fear**, there were **more short positions**.
- During **Greed**, **long positions** dominated.
- Confirms that sentiment **directly influences directional bets** (shorting in fear, buying in greed).

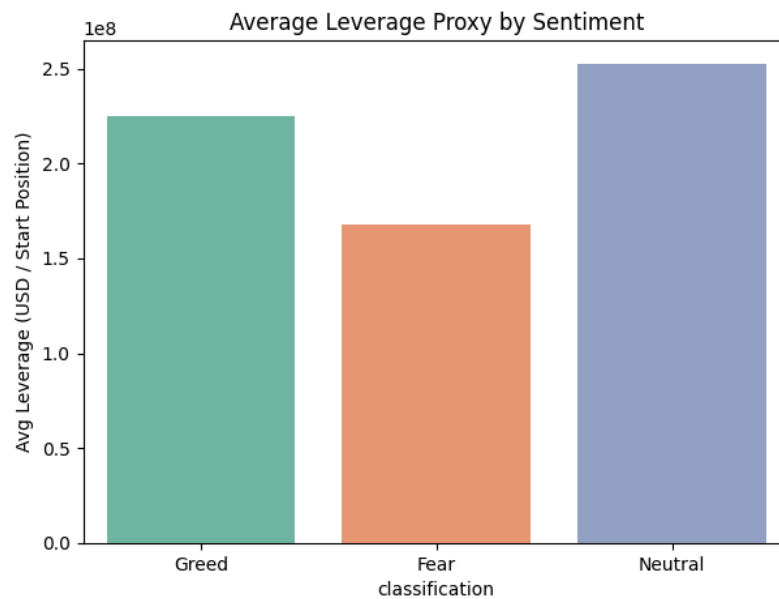


## 6. Trade Size by Sentiment (Volume)

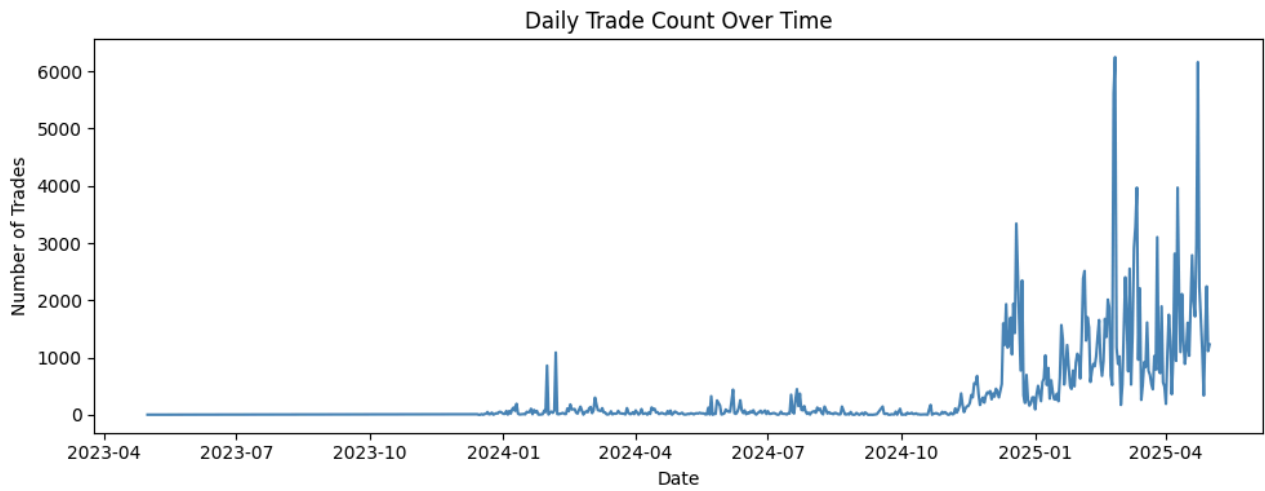


## 7. Leverage Proxy (Risk Amplification)

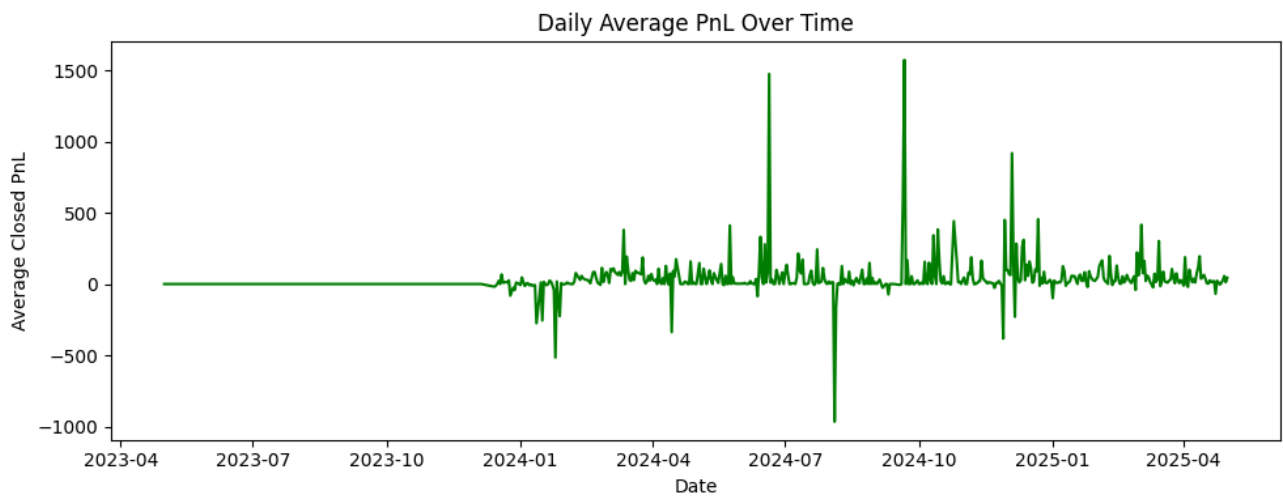
- Leverage (Size USD / Start Position) was higher during Greed.
- Traders tend to use more leverage when optimistic, potentially increasing gains or losses.



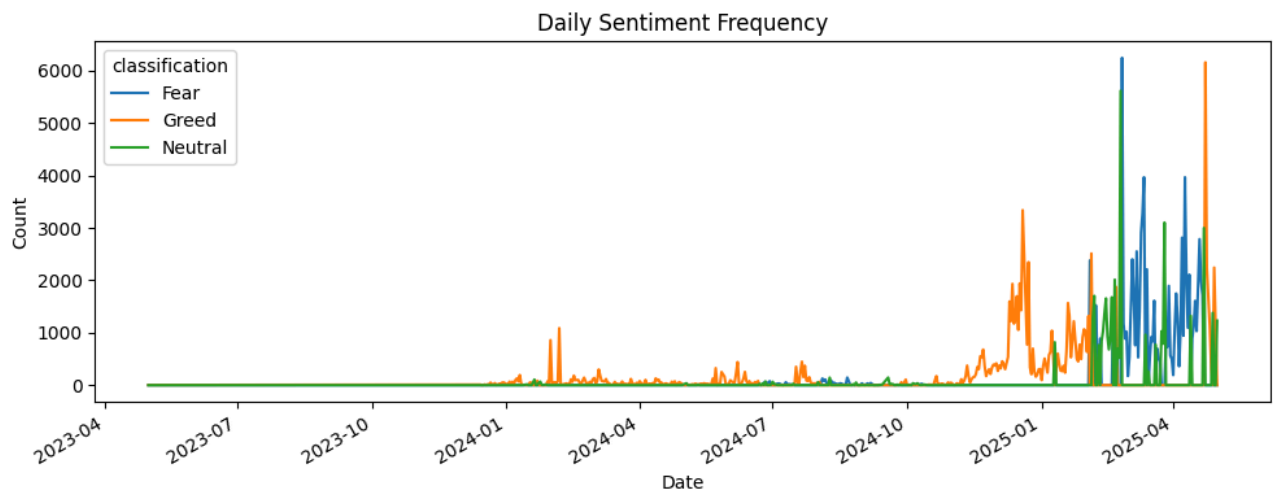
## 8. Daily Trade Count



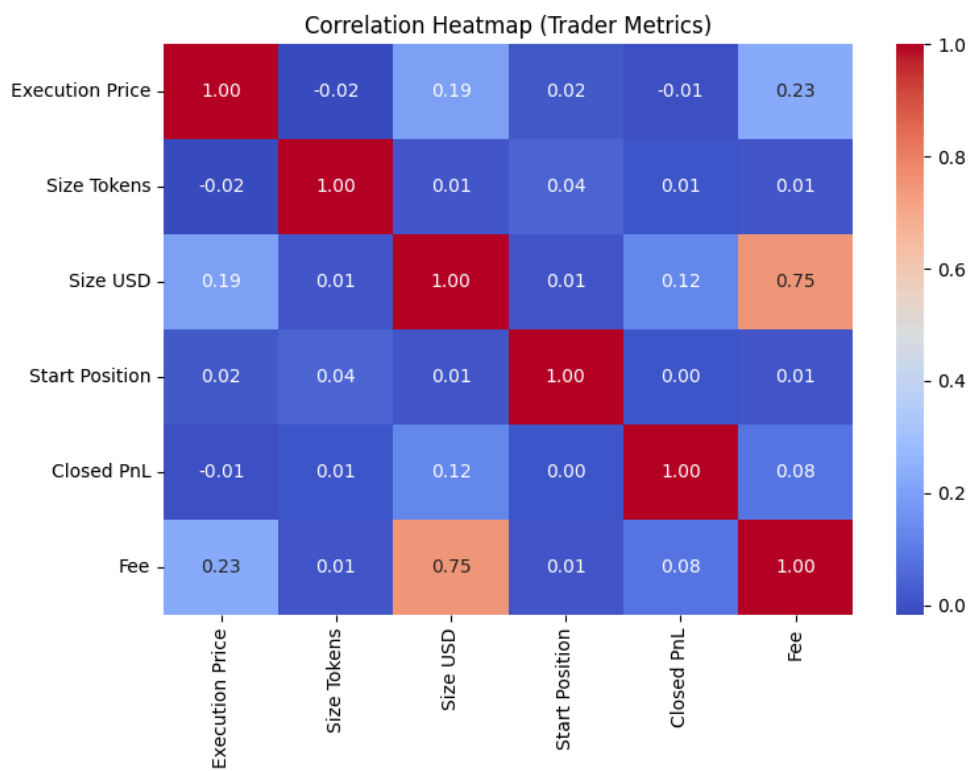
## 9. Daily Average Closed PnL



10. Daily Sentiment Frequency



11. Correlation Heatmap



## **Key Insights :**

- Trade volumes were higher during Greed periods, suggesting greater trader confidence.
- Average profitability (Closed PnL) was also higher during Greed phases.
- Leverage proxy (Size USD / Start Position) indicated more risk appetite in Greed markets.
- Fear phases saw more short positions and smaller trades.
- The correlation heatmap showed that trade size and start position are strongly related, while profitability is independent of trade size.

## **What Sentiment States Indicate :**

- Fear: Traders are risk-averse; likely to short or avoid large trades.
- Greed: Traders become aggressive with higher volume and leverage.
- Neutral: Balanced or unclear strategy; potentially mixed behavior.

## **Conclusion**

This analysis demonstrates how trading behavior is influenced by market sentiment. Greed drives higher volume and leverage, often resulting in better profits, while Fear correlates with risk aversion and more losses. Such insights are valuable in designing sentiment-aware trading strategies.

While sentiment does not guarantee trade outcomes, it provides a powerful contextual filter to enhance decision-making. Pairing sentiment with technicals or fundamentals can lead to more adaptive and smarter trading strategies.