■ 1. Introduction

This study explores how Bitcoin market sentiment (Fear, Neutral, Greed) influences trader behavior on a crypto derivatives exchange. By analyzing historical trade execution data and market sentiment index, we compare profitability, leverage, risk exposure, trading volume, and time-of-day patterns.

■ 2. Data Preparation Summary

Raw datasets were kept unchanged. A cleaned version was created after parsing timestamps, converting numeric values, and creating meaningful derived fields such as risk score (leverage × size) and profitability flag. Missing trade timestamps were removed, leverage was imputed using symbol-level median, and missing size values were set to zero. Final datasets were merged with sentiment using trade date.

■ 3. Key Insights from Visualizations

■ A. Trade Activity vs Sentiment

Trade count increased during Greed periods, showing a tendency for traders to be more active when market sentiment is optimistic.

■ B. Profitability vs Sentiment

Total realized PnL was higher during Greed, suggesting traders earned more when optimism dominated. Neutral periods showed lower gains, potentially due to indecision.

■ C. Leverage Usage vs Sentiment

Leverage levels were noticeably higher in Greed phases. Traders take more aggressive positions when they feel confident, increasing both reward and risk.

■■ D. Risk Score vs Sentiment

Total risk exposure (leverage × trade size) was highest during Greed, proving that optimistic sentiment encourages aggressive risk-taking.

■ E. Trading Hour Patterns

Most trades during Greed occurred between 10 AM and 12 PM, indicating that active trading aligns with peak market hours when sentiment is optimistic.

■ F. Correlations

Risk score is strongly correlated with leverage, while profitability showed weak correlation with trade size. This suggests that higher risk does not guarantee higher reward.

■ 4. Recommendations for Traders

✔ Avoid excessive leverage in Greed markets — risk increases rapidly.

✔ Maintain consistent position sizing to reduce volatility in returns.

✔ Use sentiment signals to adjust exposure, not to chase gains.

✔ Neutral periods may require strategy adjustments due to low profitability.

✔ Monitor risk score more than trade size to control exposure.

■ 5. Conclusion

Market sentiment strongly influences trader behavior. During Greed, traders take larger and more leveraged positions, increasing both potential profits and risks. Fear results in fewer trades but could produce more stable outcomes. Using sentiment as a strategic indicator may improve trading discipline, but leveraged exposure should be controlled to avoid amplified losses.