Analysis of Trader Behaviour and Market Sentiment

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1. Introduction

This assessment explores the relationship between Bitcoin Market Analysis and Trader behaviour using historical data. The main objective of this assessment is to find the patterns in trading, activity, and performance. This will be done across different sentiments (Greed, Fear, Neutral, etc.). The results will help in understanding smarter trading strategies.

2. Data

- **Fear & Greed Index**: Daily sentiment classification (Extreme Fear, Fear, Neutral, Greed, Extreme Greed).
- **Historical Trader Data**: Account-level trades with execution price, size, side, position, PnL, fees, leverage, etc.

  After cleaning & aggregation, both datasets were merged at the daily level.

3. Methodology

1. **Data Cleaning**
   - Converted timestamps into datetime format.
   - Removed redundant column
   - Handled missing values and calculated Bullish Ratio.
2. **Aggregation**
   - Trader history aggregated to daily level
   - Added derived metrics:
     - **Bullish Ratio** = Long trades / Total trades
     - **Bearish Ratio** = Short trades / Total trades
3. **Merge**

- Joined daily trader metrics with Fear & Greed sentiment classifications.

4. Key Insights

1. Sentiment Distribution
- Greed days dominate, while Extreme Fear is rare.
- Indicates overall bullish bias in sampled market phase.

2. Profit & Loss vs Sentiment
- Median PnL is slightly higher during Extreme Greed & Fear, but variability (risk) also increases.
- Neutral and Extreme Fear days show higher losses among outliers, suggesting defensive/liquidation trades.

3. Trading Volume vs Sentiment
- **Fear and Extreme Fear** → higher median volumes & large spikes (panic/forced liquidations).
- **Greed/Extreme Greed** → lower, more stable volumes (steady accumulation).

4. Bullish Ratio vs Sentiment
- Traders take more long positions in Greed/Extreme Greed.
- Fear periods show higher shorting behaviour.
- Suggests alignment between trader positioning and sentiment environment.

5. Execution Price vs Sentiment
- Execution prices are more volatile under Neutral/Fear.
- Extreme Fear shows lower medians, indicating accumulation during crashes.

6. Correlation Analysis
- Trading Volume (USD) strongly correlates with Fees & Token Size.
- Bullish Ratio moderately correlates with Sentiment Index (value), showing positioning follows market psychology.

5. Conclusions

- Market sentiment directly influences trading volume, positioning, and risk-taking.
- Fear and Extreme Fear drive panic behaviour, high volume, and liquidations.
- Greed/Extreme Greed show calmer, long-biased accumulation with moderate risk.

These insights can guide **risk management** strategies (e.g., tightening stops in Fear, scaling exposure in Greed).

6. Future Improvements

- Extend analysis across longer market cycles.
- Use intraday (hourly/minute) data for finer sentiment-performance mapping.
- Apply ML models (classification/regression) to predict trader PnL based on sentiment.