Trader Behaviour Analysis Under Market Sentiment

Primetrade.ai - Data Science Assignment

Candidate Name: Syed Abbas Mujthahed
Role: Junior Data Scientist - Trader Behaviour Insights

---

1. Objective

The objective of this project is to analyse how trader performance and behaviour vary under different market sentiment regimes (Fear, Neutral, and Greed). By combining historical trader transaction data with the Bitcoin Fear & Greed Index, the study aims to identify performance trends, behavioural patterns, and high-performing traders under specific market conditions.

---

2. Dataset Description

Bitcoin Market Sentiment Dataset:

- Fields: Date, Classification, Sentiment Value

- Used to classify each trading day into Fear, Neutral, or Greed regimes.

Hyper-liquid Historical Trader Dataset:

- Fields: Account, Coin, Execution Price, Trade Size (USD), Side, Timestamp, Closed PnL, Fee

- Contains over 211,000 real trading transactions.

---

3. Methodology

1. Cleaned and standardized timestamp formats

2. Mapped daily sentiment values to each trade using date alignment

3. Created performance metrics such as:

    o Total Profit & Loss (PnL)

    o Average PnL per trade

    o Win Rate

    o Trade Volume

4. Aggregated metrics by sentiment regime

5. Ranked traders by profitability under Fear and Greed conditions

6. Visualized results for behavioural insights

---

4. Key Findings

Profitability by Market Sentiment-

- Greed regime produced the highest total and average profits.

- Fear regime showed lower profitability but higher trade volume.

- Neutral regime had the lowest overall performance.

Win Rate Trends-

- Greed periods showed the highest win rate (~42%).

- Fear periods showed slightly lower win rates (~41%).

- Neutral periods had the lowest win rate.

Trading Behaviour Patterns-

- Traders executed significantly larger trades during Fear regimes.

- However, profit efficiency was higher during Greed periods.

- This indicates emotional risk-taking behaviour during market downturns and trend-following strategies during bullish sentiment.

---

5. Trader Performance Insights

- Top traders during Greed periods exhibited strong trend-following performance.

- A separate group of traders consistently generated profits during Fear regimes, indicating contrarian trading strength.

- These traders demonstrated adaptability to market psychology and volatility.

---

6. Conclusion

The analysis demonstrates a strong relationship between market sentiment and trading behaviour. Greed regimes favour trend-based profitability, while Fear regimes present opportunities for contrarian strategies. Identifying traders who perform well across different sentiment regimes can help build more adaptive and sentiment-aware trading systems.

This sentiment-driven performance framework can be leveraged to enhance strategy optimization, trader ranking models, and risk management systems in Web3 trading platforms.