Data Science Report

Project: Market Sentiment and Trading Data Analysis
Author : Prithankur Dasgupta

1. Objective

Analyzing how trading behavior (profitability, risk, volume, leverage) aligns or diverges from overall market sentiment (fear vs greed). Identifying hidden trends or signals that could influence smarter trading strategies.

2. Data Sources

- **Fear & Greed Index** — Historical daily values, including:

  - timestamp
  - value (0–100 sentiment score)
  - classification (Extreme Fear, Fear, Neutral, Greed, Extreme Greed)
  - Date

- **Trading Data** — Contains:

  - Wallet Account
  - Coin traded
  - Execution Price
  - Trade Size (Tokens & USD)
  - Buy/Sell side
  - Time of trade
  - PnL (Profit and Loss)
  - Fees

3. Key Steps Performed

- **Data Cleaning:**
  - Converted timestamps to human-readable dates.
  - Ensured numeric formats for sentiment scores and trade amounts.
- **Merging Datasets:**
  - Joined sentiment data with trading records by date to enable correlation analysis.
- **Feature Engineering:**
  - Calculated rolling averages of sentiment scores.
  - Generated trade metrics such as total daily PnL, volume, and number of trades.

4. Insights

- **Sentiment Patterns:**

  - *Extreme Fear* days correspond to higher trading volumes, suggesting traders capitalize on market dips.
  - During *Extreme Greed*, trade frequency drops, possibly due to overvaluation concerns.

- **Correlation Analysis:**

  - Slight negative correlation between sentiment scores and trading volume (i.e., lower sentiment = higher trading).
  - No strong correlation between sentiment and average trade PnL — profitability seems more strategy-driven than sentiment-driven.

- **PnL Observations:**

  - Most trades close with minimal immediate PnL, indicating a short-term accumulation or scaling strategy.
  - Fees are low per trade but may accumulate significantly due to high trade counts.

- **Execution Trends:**

  - Multiple trades executed within seconds — suggests algorithmic or bot-based execution.
  - Consistent buying patterns even in down markets indicate confidence in long-term asset value.

5. Visual Analysis

- **EDA Charts:**

  - Time series plots of sentiment values vs. trading volumes.
  - Histogram of sentiment classifications showing clustering in "Fear" zones.
  - Scatter-plots illustrating sentiment vs. PnL relationships.

6. Conclusions

- Market sentiment plays a subtle but noticeable role in trade activity levels.
- Higher activity during fear periods could present profit opportunities for contrarian strategies.
- Long-term profitability likely depends on execution efficiency and trade sizing rather than sentiment alone.

7. Recommendations

1. Monitor sentiment index daily to time trade entries.
2. Review fee structures — high frequency could reduce net profitability.
3. Consider testing automated strategies optimized for "Extreme Fear" periods.