Report

Trader Behavior vs. Market Sentiment

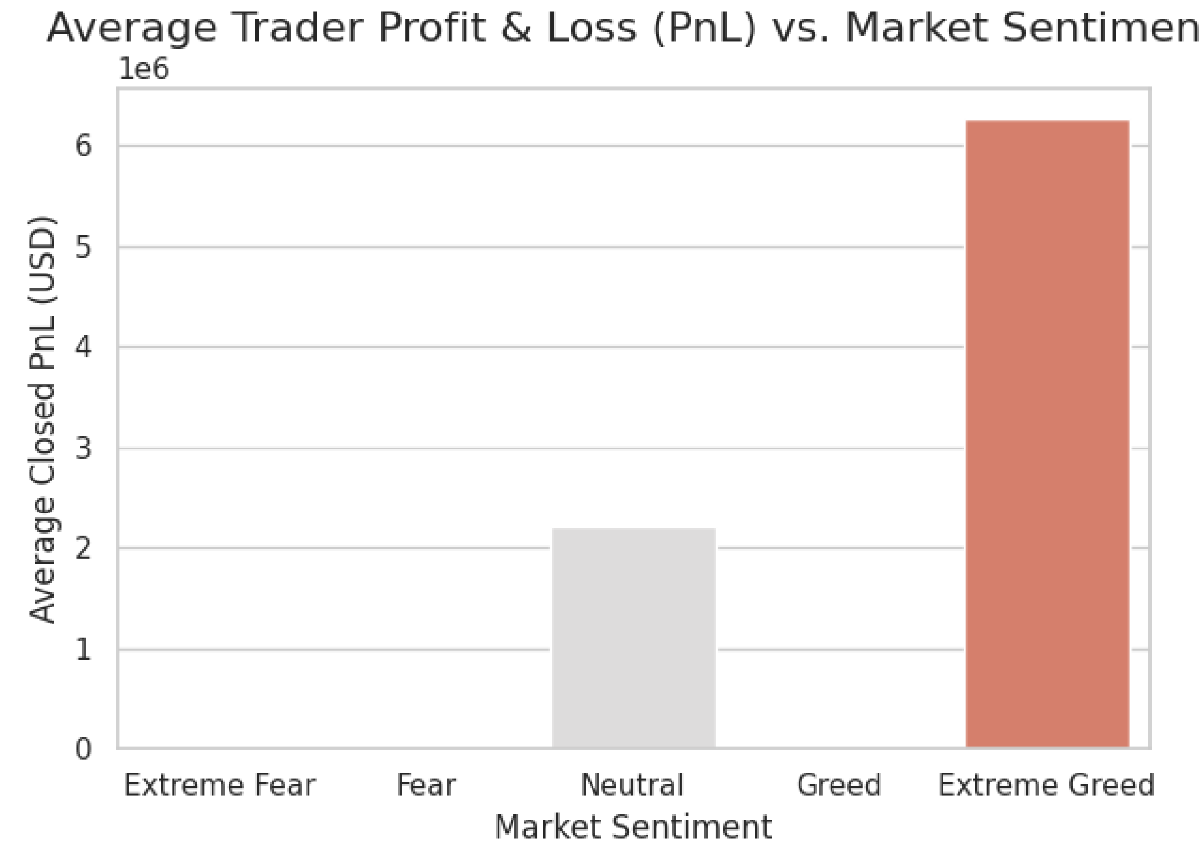
Objective: The objective of this analysis is to explore the relationship between historical trader performance (profitability, volume, and actions) and the prevailing Bitcoin market sentiment (Fear & Greed Index). The goal is to uncover patterns that could inform smarter trading strategies.

Methodology:

1. **Data Loading:** Two datasets were used:
   - Historical trader data from Hyperliquid, with columns for Account, Side, Size USD (volume), and Closed PnL (profit/loss).
   - Bitcoin Market Sentiment data, with columns for date and classification (e.g., "Fear", "Greed").
2. **Data Preprocessing:**
   - The date column in the sentiment dataset was converted to a standard datetime format.
   - The Timestamp IST column in the trader dataset was converted to a datetime format (handling parsing errors with errors='coerce'), and a matching date column was extracted to facilitate merging.
3. **Data Merging:** The two datasets were merged on the date column, linking each trade to the market sentiment of that day. The resulting processed file was saved as csv_files/merged_trader_sentiment_data.csv.
4. **Analysis:** The merged data was aggregated to analyze three key relationships, which were then visualized and saved to the outputs/ directory:
   - Average Closed PnL vs. Sentiment Classification.
   - Total Size USD (Volume) vs. Sentiment Classification.
   - Total BUY Volume vs. SELL Volume, grouped by Sentiment Classification.

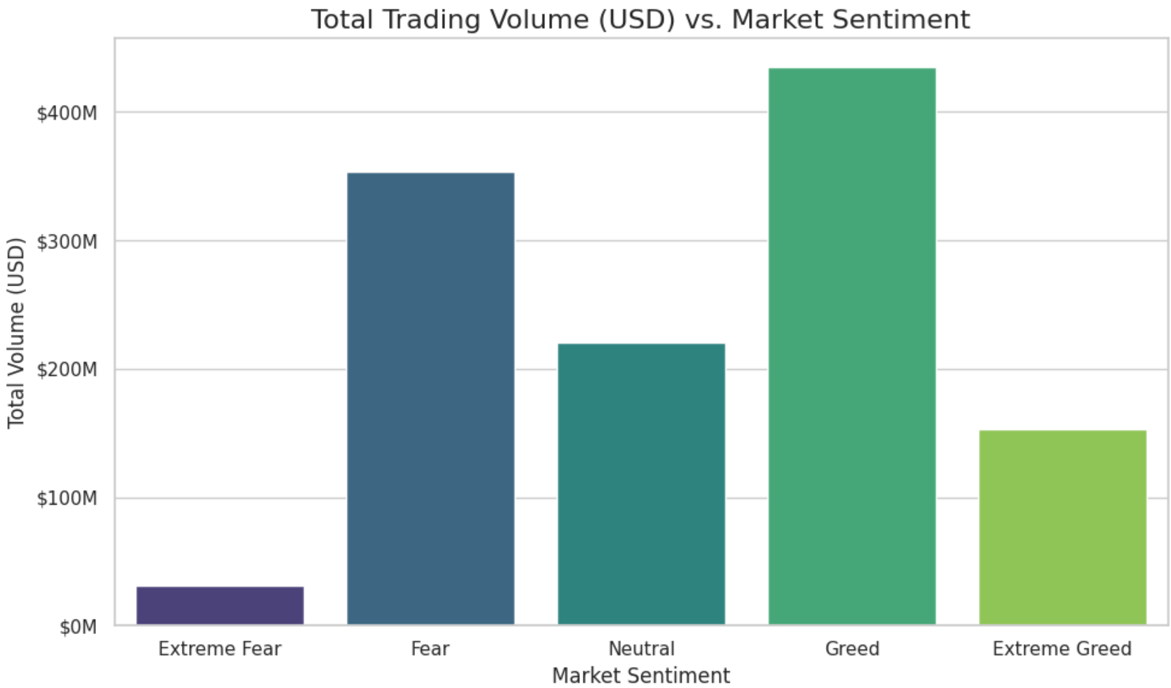
Key Findings:

1. Profitability vs. Sentiment



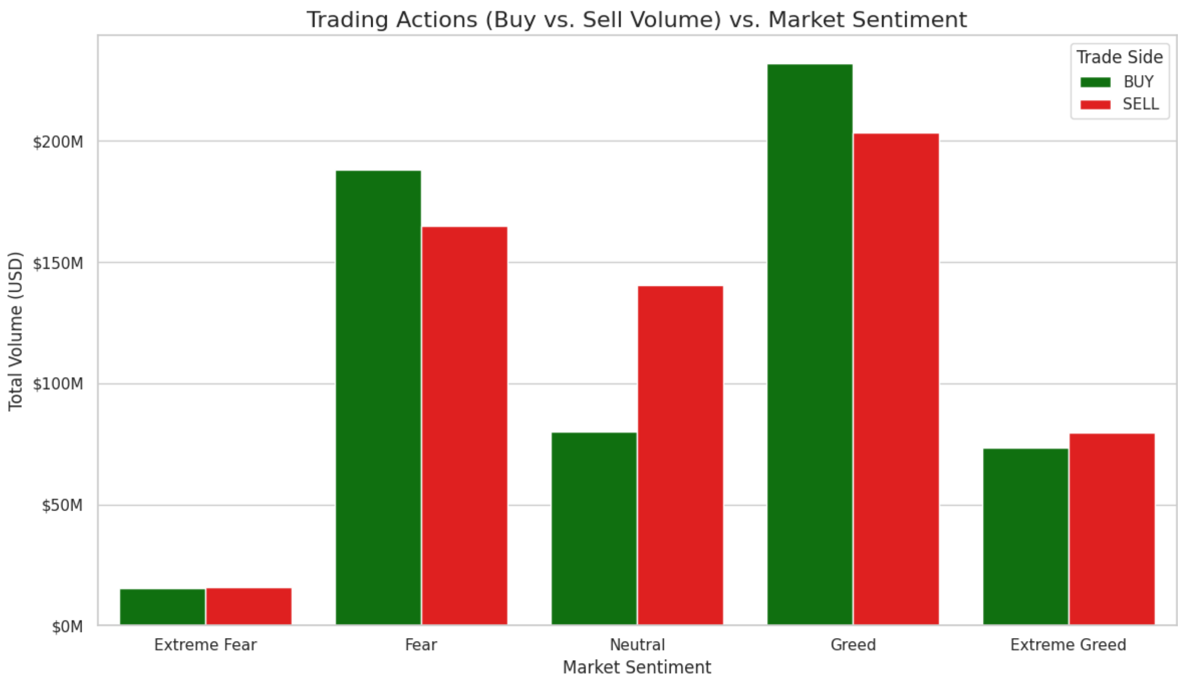
- **Finding:** The analysis of average Closed PnL reveals a distinct pattern. Traders, on average, experienced their **highest profitability during periods of "Extreme Fear"**. Conversely, they saw the **largest average losses during "Neutral"** market phases.
- **Interpretation:** This suggests that the most profitable trades (likely "buying the dip") occur during maximum market panic. The losses in "Neutral" phases could indicate trader uncertainty or being "chopped up" in a non-trending market.

2. Trading Volume vs. Sentiment



- **Finding:** Total trading volume (Size USD) is **highest during "Greed"** and **lowest during "Extreme Fear"**.
- **Interpretation:** This is a classic market behavior. "Greed" correlates with high market activity, FOMO (Fear Of Missing Out), and increased participation. "Extreme Fear" sees a significant drop-off in volume as many traders either hold their positions (HODL) or are afraid to enter the market.

3. Trader Actions (Buy/Sell) vs. Sentiment



- **Finding:** The ratio of BUY volume to SELL volume changes significantly with sentiment.
    - During **"Extreme Fear"** and **"Fear"**, the total BUY volume is substantially higher than the SELL volume.
    - During **"Greed"**, the SELL volume increases dramatically, becoming much closer to the BUY volume.

Strategic Insights & Conclusion:

The data reveals a clear, contrarian pattern among the analyzed traders:

- **Contrarian Strategy is Profitable:** The most profitable behavior observed is **acting against the crowd**. Traders who were willing to **BUY** during **"Extreme Fear"** (when volume was lowest and panic was highest) achieved the greatest average profits.
- **Greed is for Selling:** The "Greed" phase is not for entering new long positions but appears to be the optimal time for **taking profit**. The spike in both total volume and SELL-side volume during this phase indicates that smart money is distributing (selling) their assets to the "FOMO" crowd.

A "smarter trading strategy" derived from this analysis would be:

1. **Accumulate (BUY) during periods of "Extreme Fear."**
2. **Hold through "Fear" and "Neutral" phases.**
3. **Distribute (SELL/Take Profit) during periods of "Greed."**