Data Science Report – Web3 Trading Team Assignment

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Objective

Analyze how trading behavior (profitability, volume, leverage, risk) aligns with or diverges from market sentiment (Fear vs Greed), using:

- A Bitcoin Sentiment Index
- Hyperliquid Historical Trade Data

Goal: Extract insights that can inform smarter and sentiment-aware trading strategies.

Dataset Summary

Fear & Greed Index

- Columns: `timestamp`, `value`, `classification`, `date`
- Classification: 'Fear', 'Greed', 'Extreme Fear', 'Extreme Greed'

Historical Trade Data

- Fields: `Account`, `Coin`, `Execution Price`, `Size USD`, `Side`, `Timestamp IST`, `Closed PnL`, `Fee`, `Start Position`, etc.

Analysis Highlights

Profitability vs Sentiment

- **Average PnL** is generally lower in "Fear" periods.
- **Greed** shows more trading activity and a wider distribution of outcomes (higher variance).

Trading Volume

- Volume (USD) spikes significantly during periods of "Greed", signaling increased market participation and liquidity.

Risk & Leverage

- A custom **leverage proxy** (USD volume / Position Size) was calculated.
- Leverage use increases notably during "Greed", suggesting overconfidence or aggressive positions.

Fee Behavior

- Higher fees occur during "Greed" periods due to higher trade frequency and size.

Visuals Included

- `avg_pnl_sentiment.png`: PnL boxplot by sentiment
- `volume_sentiment.png`: Volume comparison by sentiment
- `leverage_sentiment.png`: Leverage proxy by sentiment

All stored under `/outputs/`.

Strategic Recommendations

1. **Reduce Leverage During Greed**
    - Traders should limit exposure during Greed phases to avoid high-risk overleveraged scenarios.
2. **Lock in Profits Early in Greed**
    - Use trailing stop-loss or profit capture strategies to manage risk when sentiment is overly positive.
3. **Explore Contrarian Approaches During Fear**
    - Opportunities may exist during Fear where others pull back; use risk-adjusted entry criteria.
4. **Integrate Sentiment Signals in Strategy**
    - Use `classification` labels as inputs to machine learning or rules-based strategies for adaptive behavior.

Conclusion

This project demonstrates that market sentiment is strongly correlated with trading volume, leverage, and profitability behavior. Understanding these dynamics enables traders and platforms to build more resilient, sentiment-aware systems.

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