Market Sentiment & Trader Performance Analysis Report

1. Objective

The goal of this project is to explore the relationship between Bitcoin market sentiment (Fear & Greed Index) and individual trader performance using historical trading data from Hyperliquid. This insight is intended to support smarter trading strategies by identifying behavioural patterns and top performers under varying market conditions.

2. Datasets Used

1. Bitcoin Market Sentiment Data

- Columns: timestamp, value, classification, date
- Sentiment types: **Fear**, **Greed**, **Extreme Fear**, **Extreme Greed**

2. Hyperliquid Trader Data

- Key Columns: Account, Coin, Execution Price, Size, Side, Timestamp, Closed PnL, Fee, etc.
- Over 211,000 trade records

3. Data Preprocessing

- Converted timestamps (ms to datetime) and aligned them to dates.
- Merged sentiment data with trade records using date as the key.
- Tagged each trade with a corresponding market sentiment classification.

4. Performance Metrics Computed

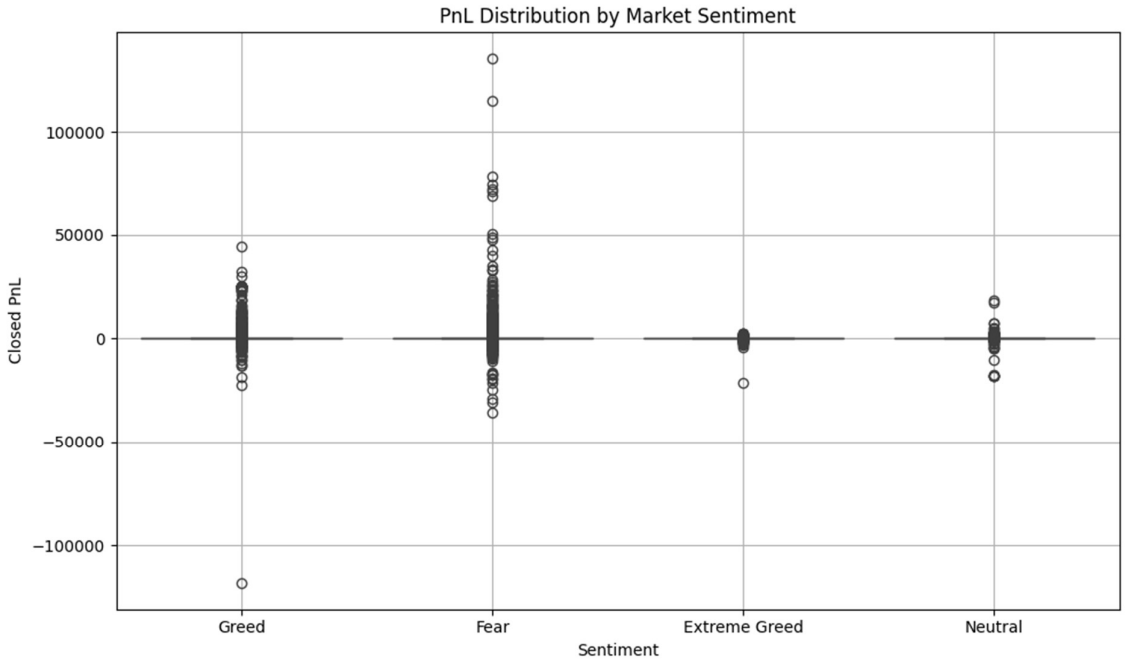
For each trader under each sentiment regime:

- **Total Trades**
- **Total PnL**
- **Average PnL**
- **Win Rate**
- **Max Drawdown**
- **Sharpe Ratio** = Avg PnL / Std Dev of PnL
- **Rankings** by Total PnL and Sharpe Ratio

5. Key Insights

A. Performance Distribution by Sentiment

- Boxplots revealed that some traders consistently profit during **Fear** regimes while others excel in **Greed**.



B. Contrarian Traders (Fear Regime)

Top performers under Fear:

- High Sharpe ratios (up to 0.46)
- Positive win rates (up to 88%)
- Low drawdowns

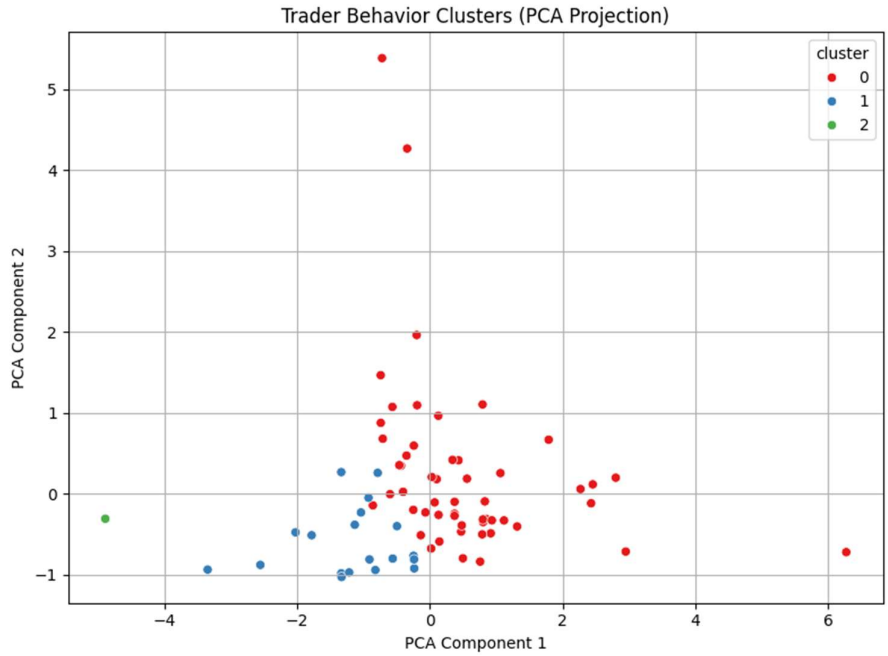
6. Clustering Analysis

Objective:

Group traders into behavioral clusters based on performance metrics.

Method:

- Used **KMeans Clustering** on scaled features: total trades, avg PnL, win rate, sharpe ratio, max drawdown.
- Visualized using **PCA projection**.



Insight:

3 distinct trader segments emerged:

- Conservative but consistent
- High-risk, high-reward
- Poor performers under volatility

7. Strategy Recommendations

- **Allocate capital** to top-ranked traders during matching sentiment phases.
- **Use clustering labels** to segment traders and adapt strategy per regime.
- Consider **Sharpe Ratio and Max Drawdown** for risk-aware portfolio decisions.

8. Conclusion

This analysis successfully links sentiment regimes to trader behaviour, highlighting profitable and contrarian trading strategies. With added clustering, it lays the foundation for automated trade evaluation and allocation strategies.