Web3 Trading Team – Data Science Assignment Report

Name: Anton Rohith  
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# 1. Problem Statement

The objective of this project is to analyze the relationship between trader behavior and market sentiment. Using trading data from Hyperliquid and the Crypto Fear & Greed Index, we aim to uncover patterns in profitability, leverage usage, and trade volume across different market sentiments (e.g., Fear, Greed).

# 2. Datasets Used

- historical\_data.csv: Contains trader-level data including execution price, size, closed PnL, leverage, etc.  
- fear\_greed\_index.csv: Contains daily sentiment classifications such as Fear, Greed, Extreme Fear, etc.

# 3. Data Processing Steps

• Converted timestamp columns to datetime format.  
• Created a dictionary to map sentiment strings to numerical scores:  
 {'Extreme Fear': 0, 'Fear': 1, 'Neutral': 2, 'Greed': 3, 'Extreme Greed': 4}.  
• Merged sentiment data into the trader dataset based on the date.  
• Cleaned null values and calculated new metrics like average leverage and win rate.

# 4. Exploratory Data Analysis

Key visualizations:

• Sentiment Distribution: Most data points fall under 'Greed' and 'Neutral'.

• Closed PnL vs Sentiment: Profitability is noticeably higher on Greed days.

• Leverage vs Sentiment: Traders take significantly more leverage during Greed periods.

# 5. Insights and Interpretation

• The average leverage used during Greed (score 3) was significantly higher than during Neutral (score 2).  
• Win rates were also higher in Greed (44.6%) compared to Neutral (31.7%).  
• Trade volume was considerably larger on Greed days, indicating more aggressive trading.

# 6. Recommendations

• Monitor market sentiment to adjust trading strategy.  
• Reduce leverage exposure during sentiment shifts.  
• Develop algorithmic signals using sentiment as an input feature.

# 7. Limitations and Future Work

• Sentiment data is discrete and may not reflect nuance in trader psychology.  
• This analysis did not include external macroeconomic variables.  
• Future work could include machine learning classification using sentiment and trader behavior.

# 8. References

- Hyperliquid Trader Dataset (Google Drive Link)  
- Fear & Greed Index Dataset (Google Drive Link)  
- Python Libraries: pandas, seaborn, matplotlib