

## Data Science Assignment – Web3 Trading Team

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### Overview:

This report analyzes the relationship between Bitcoin market sentiment (Fear & Greed Index) and trader behavior using historical trading data from Hyperliquid.

### Key Steps:

#### 1. Data Cleaning & Preprocessing

- Cleaned historical trade records, standardized timestamps, and prepared trade\_date field.
- Cleaned and converted the Fear & Greed index date format into standard datetime.

#### 2. Dataset Merging

- Merged Fear-Greed data with trader data on matching dates.
- Resulting dataset includes classification, pnl, sizes, side, leverage, and other trade variables.

#### 3. Sentiment-Based Analysis

- Compared performance (PnL, win rate) across Extreme Fear, Fear, Neutral, Greed, Extreme Greed.
- Analyzed BUY vs SELL behavior across sentiment regimes.
- Evaluated average trade size (USD and token units).
- Observed leverage patterns in different sentiment periods.

### Key Findings:

- Traders perform better during Fear and Extreme Greed conditions.
- SELL orders show higher profitability and win rate in most sentiment categories.

- Average trade size (USD) is highest during Fear periods.
- Extreme Fear shows balanced BUY/SELL activity but lower win rates for BUY.
- Greed periods show moderate performance with SELL dominating PnL contribution.

Conclusion:

Market sentiment strongly influences trader behavior and performance.

Extreme sentiment regimes (Extreme Fear, Extreme Greed) create high volatility environments that lead to increased trading opportunities and higher PnL variance.

Understanding sentiment patterns can significantly improve strategy design.