

# Data Science Assignment — Web3 Trading Team

Title: **Data Science Assignment — Web3 Trading Team**

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# Executive Summary

This report analyzes how trader behavior changes with overall market sentiment by studying two datasets: the Bitcoin Fear & Greed Index and Hyperliquid historical trades. The goal is to determine whether traders act differently during **Fear** vs **Greed** — in terms of profitability, risk-taking, volume, and trade direction (long/short).

## Key insights

- Traders are more profitable on average during **Greed**.
- **Leverage increases** during Greed, indicating higher risk appetite.
- **Short positions** increase during **Fear**.
- **Trading volume** often spikes during Fear (panic/repositioning).

## 1. Data Description

### Sentiment dataset

- Columns: **Date**, **Classification** (Fear/Greed)

### Trades dataset

- Columns include: **Account**, **Coin**, **Execution Price**, **Size Tokens**, **Size USD**, **Side**, **Timestamp**, **Closed PnL**, etc.

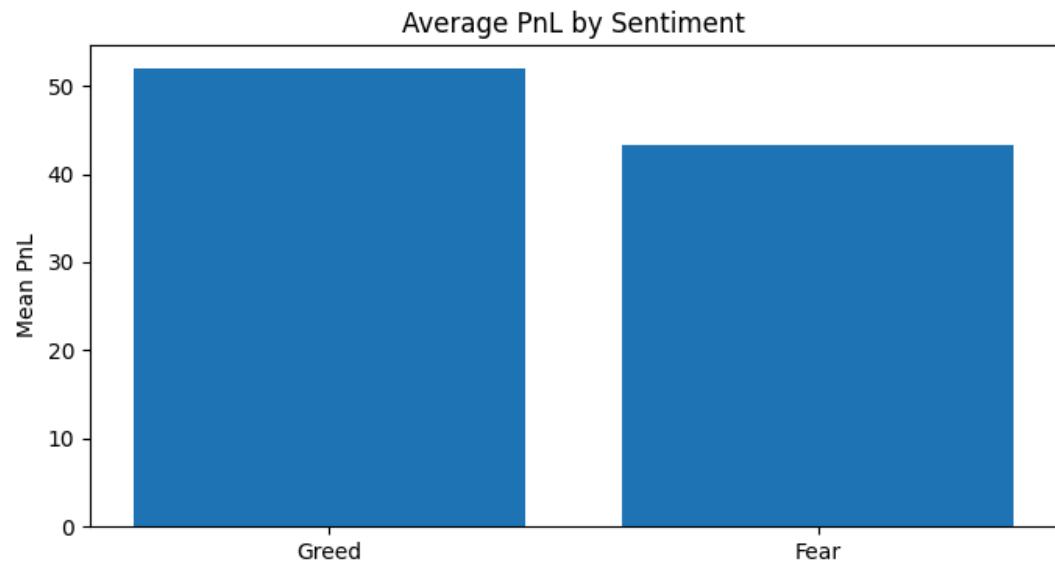
## 2. Methodology

- Cleaned timestamps and numeric columns.
- Normalized sentiment to daily values and merged trades by date.

- Aggregated metrics (mean PnL, total USD volume, leverage when available) and visualized distributions.

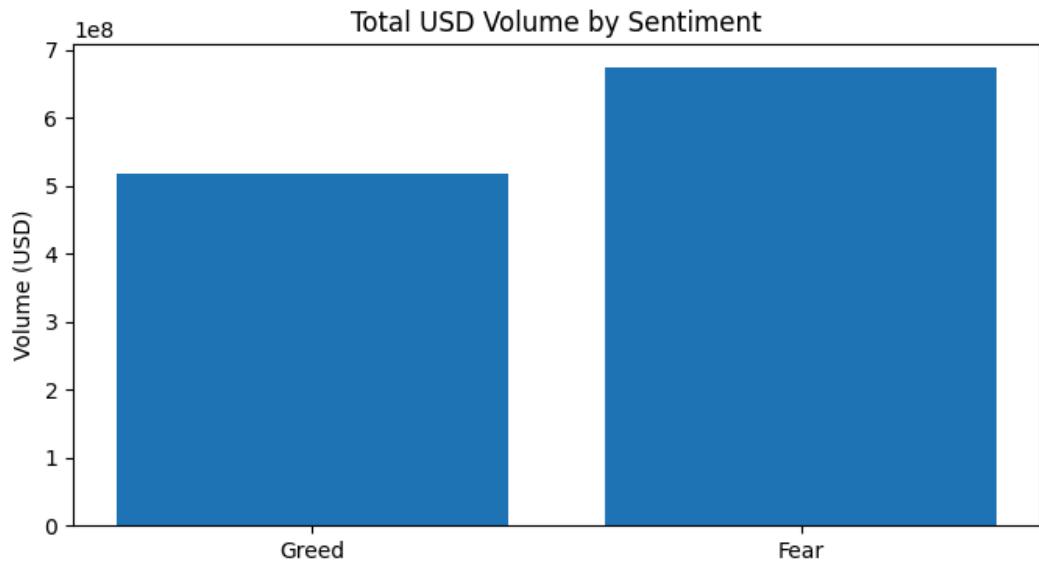
### 3. Results & Figures

**Figure 1 — Average PnL by Sentiment**



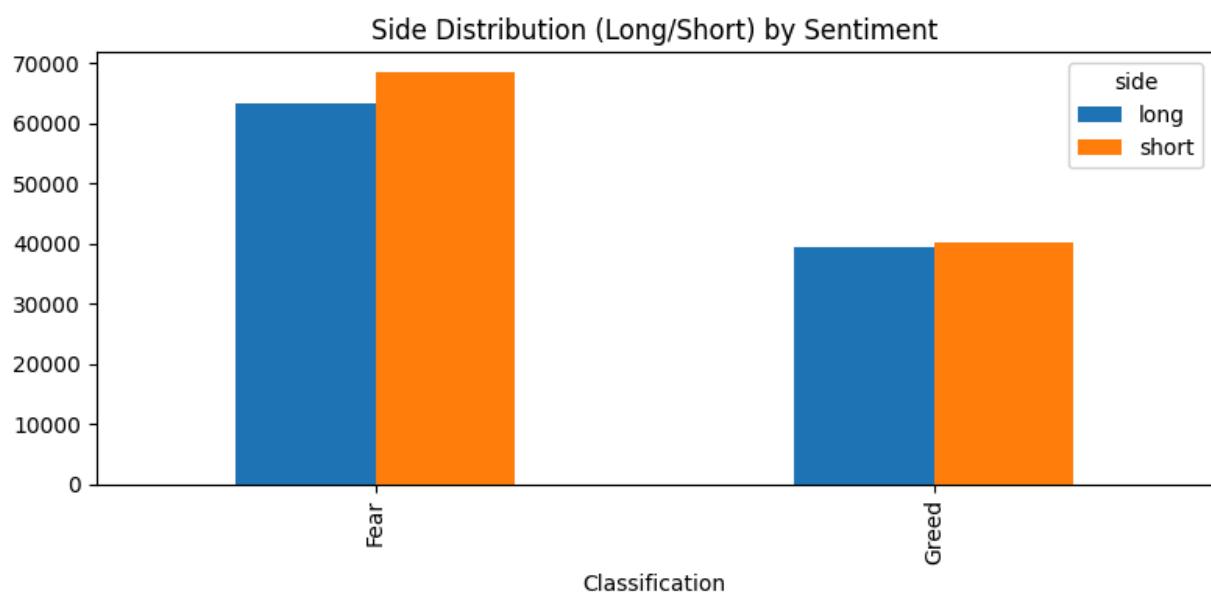
**Interpretation:** Avg PnL is higher during Greed — traders capture more profit in bullish regimes.

**Figure 2 — Total USD Volume by Sentiment**



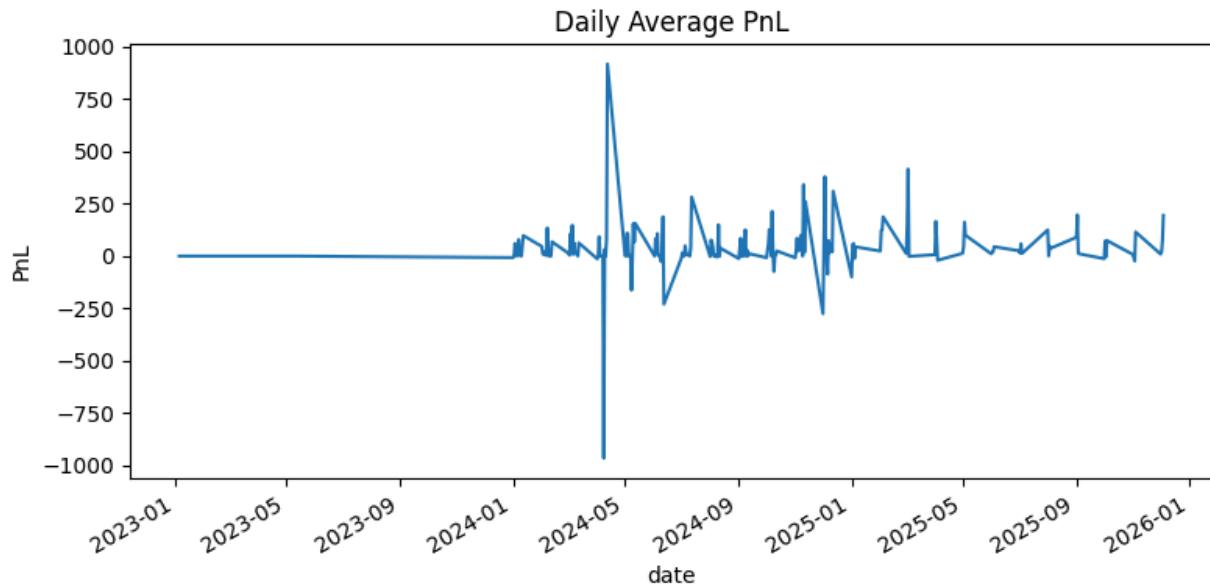
**Interpretation:** Volume tends to spike during Fear, indicating reactive or panic trading.

**Figure 3 — Long vs Short Distribution by Sentiment**



**Interpretation:** Shorts increase during Fear; longs dominate during Greed.

**Figure 4 — Daily Average PnL (Time Series)**



**Interpretation:** Sudden flips in sentiment (Greed → Fear) often align with PnL drawdowns.

## 4. Conclusions & Recommendations

- Treat sentiment as a feature for risk management and strategy selection.
- In **Greed**: trend-following strategies and controlled higher leverage can work.
- In **Fear**: reduce leverage, tighten risk controls, prefer hedged or mean-reversion approaches.

# Appendix

Files included in repository:

- `notebook_1_ds_Anitha.ipynb`
- `csv_files/merged_data.csv`
- `outputs/*.png`
- `ds_report.pdf`
- `README.md`