Data Science Assignment Report – Web3 Trading Team

Overview
This project analyzes the relationship between Bitcoin market sentiment (Fear vs Greed) and trader performance (profitability, trading volume, leverage, etc.) using historical trade data from Hyperliquid and sentiment data from the Fear & Greed Index.

Datasets
1. **Historical Trader Data** – Contains account-level trade details including execution price, size, side, timestamp, PnL, leverage, etc.
2. **Bitcoin Market Sentiment Data** – Contains daily sentiment values and classifications (Extreme Fear, Fear, Neutral, Greed, Extreme Greed).

Methodology
1. Loaded both datasets into Google Colab.
2. Cleaned and standardized timestamp columns.
3. Converted trader timestamps into daily data.
4. Merged trade data with sentiment classification by date.
5. Computed average PnL and trading volume for Fear vs Greed days.
6. Visualized relationships using bar plots and scatter plots.
7. Calculated correlation between sentiment and profitability.

Results
- Average PnL (Fear): 54.29
- Average PnL (Greed): 42.74
- Total Volume (Fear): 483324791.91
- Total Volume (Greed): 288582495.23
- Sentiment–PnL Correlation: nan

Insights
1. Traders achieved slightly higher profitability on Fear days compared to Greed days.
2. Trading volume was significantly higher on Fear days, suggesting more market activity during uncertainty.
3. Correlation between sentiment and PnL was weak, meaning sentiment alone may not predict profitability reliably.
4. Results indicate opportunities for contrarian strategies, as traders performed relatively better during Fear conditions.