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## **Data Science Analysis: Sentiment and Trading Behavior for Web3**

### Methodology and Data Scope

- **Data Sources:** State that the analysis uses daily aggregated Hyperliquid Trader Data and the Bitcoin Market Sentiment Index.
- **Data Constraint:** Explicitly state that **leverage data was unavailable** and was therefore omitted from the analysis.
- **Metrics:** Confirm the key daily metrics analyzed: Total PnL (profitability), Total Volume, and the numerical Sentiment Score.

Core Analysis and Market Behavior

Generate summary tables and charts (represented by titles) for the following:

Analysis	Key Insight to Emphasize
Avg Daily PnL vs. Sentiment (Bar Chart)	Profitability is highest during Fear, confirming a counter-sentiment trend.
Total Volume vs. Sentiment (Bar Chart)	Total trading volume is highest when the market is fearful or neutral (Negative Correlation: approx 0.30), indicating activity around corrections.
Contemporaneous Correlation (Heatmap)	Reiterate the moderate negative correlation between Sentiment Score and Total Volume, indicating market activity is inversely related to market optimism.

## Advanced Insights (Hidden Trends)

Advanced Analysis	Key Insight to Emphasize
<b>PnL Distribution and Volatility</b> (Box Plot)	<b>Risk Management Failure:</b> Extreme Greed days have the worst median PnL and the highest overall volatility (widest spread of losses).
<b>Directional PnL: Gains vs. Losses</b> (Bar Chart)	<b>Efficiency Signal:</b> The ratio of Gains to Losses is best during <b>Extreme Fear</b> , proving that buying capitulation is the most efficient strategy for these traders.

## Predictive Signal and Strategy

- **Lagged Finding:** Focus on the result of the **Yesterday's Sentiment vs. Today's PnL** analysis. State that there is a **negative correlation** ( $r \approx -0.12$ ) between a positive sentiment score on day T-1 and profitability on day T.
- **Strategy Proposal (Final Output):** Propose the **Lagged Greed Fade Strategy**.
  - **Trigger:** If the **Lagged Sentiment Score is  $\geq 1.0$  (Greed or Extreme Greed)**.
  - **Confirmation:** If **Today's Total Volume is below the 7-Day Rolling Average** (signaling market exhaustion).
  - **Action:** Initiate a **Counter-Trend Short** position, or aggressively raise stop-loss limits on existing long positions.
  - **Rationale:** The market overextended yesterday and is showing fatigue today, making a reversal highly probable.