🔍 Objective

The goal of this analysis is to explore how **trader behavior** — such as profitability, leverage, and trade volume — aligns or diverges from the **overall market sentiment**, categorized as *Fear* or *Greed*. The insights are intended to reveal trading patterns that could inform smarter strategies in a Web3 environment.

🗂️ Datasets Used

1. **Bitcoin Market Sentiment (Fear & Greed Index)**
    - Columns: date, classification
    - Values range from *Extreme Fear* to *Extreme Greed*
2. **Historical Trader Data from Hyperliquid**
    - Columns: Timestamp, Execution Price, Size, Side, ClosedPnL, Leverage, etc.
    - Cleaned and summarized into daily aggregates

🧹 Data Preprocessing

- Unix millisecond timestamps converted to datetime
- Daily aggregates computed:
    - Average execution price
    - Total trade size
    - Average and total PnL
- Sentiment classification cleaned and normalized
- Final merged dataset created on the common date field

📊 Key Insights from EDA

1. Average Profitability vs. Sentiment

- Traders had **higher average PnL during periods of Greed**.
- Profitability dropped significantly in periods classified as Fear or Extreme Fear.

2. Trade Volume vs. Sentiment

- Total trade volume was **generally higher during Fear**, indicating more cautious but frequent trading.
- This could suggest short-term strategies during uncertain times.

3. Execution Price Trends

- Execution price trends aligned moderately with sentiment phases.
- Greed phases often coincided with rising execution prices, hinting at bullish activity.

📈 Visual Outputs

All charts saved in the outputs/ folder:

- avg_pnl_by_sentiment.png
- volume_by_sentiment.png
- exec_price_trend.png

✅ Conclusion

The analysis indicates a **clear behavioral shift** between Fear and Greed phases. Understanding this sentiment-performance relationship can help in **optimizing entry/exit strategies** in volatile crypto markets.