Relationship Between Trader Behavior and Market Sentiment (Fear & Greed Index)

1. Objective

The goal of this analysis is to understand how trader behavior (profitability, risk, trading volume, and leverage) aligns with or diverges from market sentiment, as measured by the **Fear & Greed Index (FGI)**.

We explore:

- ✓ Do traders behave differently during fear vs. greed?
- ✓ Does FGI predict trading activity (volume, PnL, leverage)?
- ✓ Are there hidden signals that can guide better strategies?

2. Exploratory Findings (from plots)

- ✓ **Trade Counts by Sentiment:**
  Most trades occur during *Greed* and *Fear* periods, while activity is lower in *Extreme Fear* or *Extreme Greed*.
  → Traders tend to follow sentiment momentum.
- ✓ **Average Trade Size by Sentiment:**
  During *Greed*, average trade sizes are higher.
  → Suggests more aggressive positioning when optimism is high.
- ✓ **Correlation Heatmaps:**
  - Weak to moderate correlation between daily FGI and trade volumes.
  - Leverage shows low correlation with sentiment.
    → Sentiment is not the only driver; other market factors matter.
- ✓ **Trend Plots:**
  - Trade volume spikes often align with strong sentiment swings (e.g., from Fear → Greed).
  - Profitability is more volatile in Fear regimes.
  - Traders tend to over-leverage during Greed, amplifying both gains and risks.

3. Statistical Tests

- **Granger Causality**
  - ✓ **FGI → Trade Volume:**
    Significant ($p < 0.05$) for lags 1–2.
    → Market sentiment *helps predict* next-day trading volume.
  - ✓ **FGI → Profitability:**
    Weak evidence ($p \approx 0.06$ at lag 1, significant at lag 2).
    → Profitability sometimes depends on sentiment, but not strongly.
  - ✓ **FGI → Leverage:**
    Mostly insignificant, except weak significance at lag 1 ($p \approx 0.08$).
    → Leverage decisions are less sentiment-driven.
- **OLS Regression**
  - ✓ **Trade Volume vs FGI:**
    Strong negative relationship (coef = -88k, $p < 0.001$).
    → As FGI rises (more Greed), *trade volume decreases*.
    Possible reason: traders take fewer but larger bets in greed.
  - ✓ **Profitability vs FGI:**
    Negative but weak (coef = -318, $p = 0.07$).
    → Profitability slightly falls during Greed. Suggests overconfidence leads to losses.
  - ✓ **Leverage vs FGI:**
    Significant negative relation (coef = -950, $p = 0.03$).
    → Higher FGI (more Greed) → Lower average leverage.
    Traders reduce leverage when optimistic, preferring direct exposure.

4. Key Takeaways

1. **Sentiment predicts trading activity** – Fear & Greed index is a useful signal for anticipating volume changes.
2. **Greed ≠ Profit** – More greed often reduces profitability, possibly due to riskier trades or crowded positions.
3. **Leverage not purely sentiment-driven** – Though weakly correlated, leverage is likely affected by risk controls and market structure.
4. **Traders react to Fear** – Spikes in volume and volatility are common during Fear, signaling opportunities for contrarian strategies.

5. Recommendations

- ✓ **Strategy Design:**
  Use FGI as an input for volume forecasting models.
- ✓ **Risk Management:**
  Extra caution during Greed periods, as overconfidence may reduce profits.
- ✓ **Contrarian Signals:**
  Extreme Fear may offer profitable entry points since volume spikes but sentiment is low.