Trader Behaviour Insights under Fear & Greed Market Conditions

1. Objective

The objective of this analysis is to study how **market sentiment (Fear vs Greed)** influences **trader behaviour**, particularly in terms of:

- Risk exposure (position size)

- Profitability (PnL)

- Trade outcomes and consistency

This study combines historical trader data with the Bitcoin Fear & Greed Index to uncover behavioural patterns.

2. Datasets Used

2.1 Trader Transaction Data

- Source: Hyperliquid historical trader dataset

- Records: 200k+ trades

- Key fields:

    o Execution price

    o Position size (USD)

    o Closed PnL

    o Trade timestamp

    o Direction (Buy/Sell)

2.2 Market Sentiment Data

- Source: Bitcoin Fear & Greed Index

- Sentiment categories used:

    o **Fear**

    o **Greed**

- Neutral sentiment was excluded for clearer behavioural contrast.

3. Data Preprocessing

- Converted timestamps to datetime format

- Extracted date-level features for merging datasets

- Filtered sentiment to Fear and Greed only

- Merged datasets on trading date

- Created a cleaned dataset (processed_data.csv) for analysis

4. Exploratory Data Analysis & Visualizations

4.1 Average Risk Exposure by Sentiment

Insight:
Traders exhibit **higher average position sizes during Fear** compared to Greed, suggesting increased risk-taking or defensive averaging during fearful market conditions.

4.2 Average Profit & Loss (PnL) by Sentiment

Insight:
PnL varies significantly with sentiment. While higher risk is observed during Fear, it does not always translate to proportionally higher profitability.

4.3 Win Rate by Market Sentiment

Insight:
Win rate analysis shows that trade consistency differs between Fear and Greed phases, highlighting behavioural inefficiencies under emotional market conditions.

4.4 PnL Distribution Analysis

Insight:
The PnL distribution reveals greater volatility and outliers during Fear periods, indicating higher uncertainty and risk dispersion.

5. Key Findings

- Traders take **larger positions during Fear**, increasing risk exposure

- Greed periods show **more controlled position sizing**

- Higher risk does not guarantee higher returns

- Market sentiment significantly impacts trading behaviour and outcomes

6. Conclusion

This analysis demonstrates that **market psychology plays a critical role in trading decisions**. Fear-driven markets tend to encourage higher risk exposure, while Greed-driven markets show relatively disciplined behaviour. Understanding these patterns can help in designing better risk management strategies and sentiment-aware trading models.

7. Tools & Technologies

- Python

- Pandas & NumPy

- Matplotlib

- Google Colab