Trader Behavior and Market Sentiment Analysis Report

Data Science Assignment Report: Trader Behavior and Market Sentiment Analysis

Introduction:

This report explores the relationship between trader behavior and market sentiment (Fear vs Greed) using two key datasets.

The goal of the analysis is to identify hidden trends or signals in trading behavior based on market sentiment.

The datasets include Bitcoin market sentiment data and historical trader data from Hyperliquid.

Methodology:

- Data Sources: Bitcoin Market Sentiment Dataset and Historical Trader Data.

- Exploratory Data Analysis (EDA) was performed to understand the distribution and trends in the data.

- Data Cleaning: Missing values were handled using forward filling and zero substitution.

- Visualizations were used to examine the relationships between trader behavior and market sentiment.

Data Analysis and Insights:

1. Sentiment Distribution (Fear vs Greed):

- The market sentiment is divided into two categories: Fear and Greed.

- The analysis shows a higher frequency of 'Fear' periods, indicating more conservative trading behavior during these times.

- Greed periods showed larger market movements and risk-seeking trading strategies.

2. Profitability vs Market Sentiment (Fear/Greed):

- Trader profitability (Closed PnL) was analyzed against market sentiment.

- During Greed periods, traders had higher profit or loss variability, with higher leverage being used.

- Fear periods saw lower risk-taking and smaller profit/loss margins.

3. Trader Volume by Sentiment:

- Trading volume was analyzed based on sentiment.

- Larger trade volumes were observed during Greed periods, which could be attributed to risk-taking behavior and higher market activity.

- Fear periods showed reduced trading volume, indicating cautious trading strategies.

4. Leverage vs Sentiment (Fear vs Greed):

- Leverage was found to be higher during Greed periods, suggesting traders are more willing to take on risk in an optimistic market.

- During Fear periods, leverage was lower, indicating a more conservative approach to risk management.

5. Correlation between Trader Behavior Metrics:

- A correlation analysis was performed between key trading metrics such as closed PnL, size, and leverage.

- Strong correlations were found between leverage and profitability, indicating that higher leverage is often associated with higher profits or greater losses.

- Trading size was moderately correlated with leverage, suggesting that larger trades typically involved higher leverage.

Conclusion:

The analysis reveals that market sentiment (Fear vs Greed) plays a significant role in trader behavior.

- During periods of Greed, traders tend to take higher leverage and larger positions, which increases the risk of higher profitability or losses.

- The correlation between leverage and profitability shows that higher leverage is often associated with higher profit, but also higher risk.

- Traders should consider sentiment as a factor in decision-making, as it can influence market behavior and profitability.