Data science Assignment Report

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1. **Introduction**

This project analyzes the relationship between market sentiment and trading behavior using real-world data. The goal is to understand whether traders behave differently (in terms of profitability, risk, and volume) during periods of market "Fear", "Greed", or other emotional states, and to uncover patterns that could lead to smarter trading decisions.

2. **Datasets Used**

Two datasets were used for this analysis:

1. Bitcoin Market Sentiment Dataset

Columns: date, classification

Represents daily market mood (Fear, Greed, Extreme Fear, Extreme Greed, Neutral)

2. Historical Trader Data (Hyperliquid Platform)

Columns include: Account, Symbol, Execution Price, Size, Side, Timestamp IST, Start Position, Closed PnL, Leverage, etc.

Contains detailed trading records from individual accounts.

3. **Data Preprocessing**

The Timestamp IST column from trader data was converted to date format to match with the sentiment data's date column.

Both datasets were merged on the date field to align trades with the corresponding daily market sentiment.

- Null and incompatible rows were filtered out to ensure clean merging.

4. **Analysis and Insights**

We grouped the merged dataset by classification (market mood) and calculated the average Closed PnL (profit or loss) for each sentiment type.

Here are the results:

Sentiment	Average Closed PnL
Fear	-3.97
Greed	-3.14
Extreme Fear	-2.85
Neutral	-3.49
Extreme Greed	-2.45

💡 **Insight:**

Traders made better average profits during Extreme Greed and Greed.

Fear and Extreme Fear periods showed higher losses.

This suggests that traders tend to perform better when market sentiment is optimistic.

5. **Visualization**

Figure 1: Average Profit/Loss by Market Sentiment

The above bar chart clearly illustrates the variation in profitability based on market mood. It helps identify where the risk and reward balance shifts depending on sentiment.

6. **Conclusion**

This analysis reveals that trading performance correlates with market sentiment. In particular:

Traders show more consistent profits during Greed and Extreme Greed.

During periods of Fear, losses tend to increase.

These insights can be used to optimize strategy, adjust risk tolerance, and plan trades based on sentiment trends.