Data Science Report - Amir Yousuf

This project analyzed historical trading data from Hyperliquid alongside the Bitcoin Market Sentiment Dataset (Fear & Greed Index) to examine how sentiment influences trader behavior. The dataset `historical_data.csv` provided transaction-level records of trader activity, including buy/sell actions, execution prices, and realized PNL. The dataset `fear_greed_index.csv` provided daily market sentiment values, ranging from Extreme Fear to Extreme Greed.

After cleaning and aligning timestamps across both datasets, daily-level metrics were generated to study trader activity in relation to sentiment. Key analyses included trading volume, profitability trends, and risk assessment. The results revealed that trading volume tended to increase during Greed phases, indicating heightened market activity when sentiment was optimistic. In contrast, the standard deviation of daily PNL (pnl_std), a measure of trading risk, was observed to rise during Fear periods, suggesting that fearful markets were more volatile.

A notable behavioral pattern was also identified: the ratio of buy trades increased during Extreme Fear periods. This suggests that some traders adopted contrarian strategies - buying when the market was fearful - and these periods often correlated with positive average PNL, highlighting potential profit opportunities.

Overall, the findings indicate a strong relationship between sentiment and trading behavior. A recommended strategy would be to consider more buy-side positions during periods of Extreme Fear while closely monitoring volatility and risk.