Trader Performance & Market Sentiment Analysis

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1. Objective

The purpose of this project was to understand how trader performance changes across different market sentiment conditions such as **Fear**, **Greed**, *and* **Extreme** phases.

Using the Fear-Greed Index and historical trading data, the analysis aimed to find how emotions reflected in market sentiment impact profit/loss, trading volume, and overall trader behavior.

The study also identifies traders who perform consistently well in different sentiment scenarios.

2. Datasets used

a) **historical_data.csv** – Contains trading records including timestamps, account IDs, trade sides (buy/sell), position sizes (USD), and closed profit or loss.

b) **fear_greed_index.csv** – Represents the daily Fear-Greed Index values and corresponding sentiment classifications ranging from *Extreme Fear* to *Extreme Greed*.

Both datasets were merged using the common field **"date"**, after converting timestamps to standard date formats.

3. Methodology

The analysis was carried out in Google Colab using Python.

The key steps followed were:

a) **Data Cleaning**: Converted timestamps, handled missing values, and ensured proper data alignment between both files.

b) **Merging Datasets**: Linked daily sentiment scores with the trading data.

c) **Exploratory Analysis**: Studied trade distribution and profit/loss under different sentiment classes.

d) **Correlation Study**: Examined the relationship between the Fear-Greed Index and overall daily profits.

e) **Ranking & Visualization**: Identified top traders and most profitable days for each sentiment class, supported by clear visual dashboards.

All graphs and processed outputs were saved in organized folders under **/outputs** and **/csv_files**.

4. Key Insights

a) **Profitability**: The highest average Closed PnL was observed during ***Greed*** and **Extreme Greed** periods, showing that traders benefit more in optimistic markets.

b) **Trading Volume**: Total trading volume also peaked during Greed phases, indicating higher market activity.

c) **Fear Phases**: During **Fear** and **Extreme Fear**, there were more trades, but the average profit per trade was lower, suggesting cautious or defensive trading.

d) **Correlation**: A mild negative correlation was found between the Fear-Greed Index and daily profit, implying that profits can sometimes increase when sentiment drops.

e) **Top Traders**: Each sentiment phase had a distinct set of top traders who adapted well to changing market conditions.

5. Tools & Technologies

a) **Python Libraries**: Pandas, NumPy, Seaborn, Matplotlib

b) **Platform**: Google Colab

c) **Storage**: Google Drive (for saving outputs and datasets)

d) **Repository**: GitHub

The complete project, including datasets, code, and outputs, has been uploaded to a public GitHub repository for review.

6. Conclusion

This project helped in understanding how market emotions influence trading behavior and profitability. The visualizations made it clear that both optimism (Greed) and fear-driven sentiment affect how traders perform. The findings can support strategy development by helping identify when to act with or against market sentiment.

Overall, the analysis combines technical data processing with meaningful financial interpretation, creating a complete end-to-end study of trader behavior under emotional market conditions.