

PRIMETRADE.AI

DATA SCIENCE ASSIGNMENT REPORT

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1. Objective

This report explores the relationship between trader performance and market sentiment (Fear vs. Greed) using:

- Historical trader dataset
- Bitcoin market sentiment classification dataset

We aim to identify how sentiment impacts profitability, risk-taking, and efficiency, and shown top traders under different sentiment conditions.

2. Data Sources

- **Trader Data:** Contains account-level trade executions, prices, volume, PnL, and timestamps.
- **Sentiment Data:** Daily sentiment index (Fear, Greed, Extreme Fear) with date.

We merged these datasets by date to analyse trading behaviour during different sentiment regimes.

3. Data Cleaning & Processing

- Standardized column names and formats
- Parsed timestamp into proper datetime
- Created new roi metric = $\text{PnL} / (\text{Execution Price} \times \text{Size})$
- Merged both datasets on the date column
- Saved clean dataset to csv_files/merged_data.csv

4. Exploratory Data Analysis (EDA)

- PnL under Sentiment:

- Traders show greater profit variability during Fear.
- Many trades are loss-making during Extreme Fear, suggesting risk aversion or panic selling.

- ROI under Sentiment:

- ROI was more skewed during Greed, indicating more aggressive and risk-heavy trading.
- Some traders succeeded with high ROI during Fear — showing contrarian behavior.

- Correlation Heatmap:

- Strong correlation between trade size and PnL
- Weak correlation between ROI and execution price

5. Trader Performance Ranking

We grouped traders by account and sentiment, then ranked them based on:

- Average ROI
- Total PnL
- Trade Volume

Top 10 Traders (Fear)

- Traders who consistently delivered ROI during Fear days
- Indicates strength under volatile, uncertain conditions

Top 10 Traders (Greed)

- Took higher risks but with profitable returns

6. Conclusion

This analysis highlights how market sentiment affects trading performance.