Data Science Assignment Report

Introduction

This project analyzes the relationship between trader behavior and Bitcoin market sentiment (
Fear & Greed Index). The objective is to identify how trading performance, volume, and risk-taking align or
diverge from overall market sentiment.

Datasets Used

Historical Trader Data – 211,224 trades (2023 – 2025).
Includes account, symbol, execution price, trade size, leverage, side, closed PnL, etc.
Fear & Greed Index – 2,644 daily records (2018 – 2025).
Includes date, sentiment value, and classification (Fear/Greed).

Methodology

Standardized and cleaned column names.
Converted timestamps into proper datetime format.
Aggregated trader data daily: total trades, trading volume (USD), average execution price, median PnL, and
win rate.
Merged datasets by date, using forward/nearest fill for sentiment gaps.
Conducted EDA, correlation analysis, and statistical comparisons.

Key Findings

Profitability: Median PnL is low or negative on most days, reflecting the difficulty of consistent gains.
Volume vs Sentiment: Weak correlation between total trading volume and the Fear-Greed Index.
Risk Behavior: Leverage usage and volume did not show significant adjustments between Fear and Greed
days.
Fear vs Greed Comparison: Subtle differences in win rate and volume, but not statistically significant due to
limited overlap.

Conclusion

The analysis suggests that **short-term trader behavior** is not strongly aligned with **daily market sentiment.**
Broader market psychology (Fear vs. Greed) may influence long-term positioning, but execution outcomes
depend more on volatility and micro-level factors. Longer datasets and segmentation of trader types could
reveal deeper patterns.