



Data Analysis Project Report

Introduction

This report summarizes the analysis performed on trader Profit & Loss (PnL) data merged with the Fear & Greed Index. The goal of this project was to explore how market sentiment influences trading behavior, visualize Buy/Sell patterns, and investigate correlations between sentiment and profitability.

Data Description

Two datasets were used in this analysis:

1. **Historical Data** — containing transaction details, trade direction (Buy/Sell), and profitability.
2. **Fear & Greed Index** — representing overall market sentiment on a daily scale.

These datasets were merged on the **date** field to enable sentiment-based analysis of trading activity.

Methodology

The following steps were carried out in the notebook:

- **Data Preprocessing:** Handling missing values, aligning dates, and cleaning sentiment values.
 - **Data Enrichment:** Adding derived columns to represent sentiment categories (Greed vs. Fear).
 - **Merging Datasets:** Trader PnL data combined with sentiment index by date.
 - **Exploratory Data Analysis (EDA):** Performed using Pandas, Matplotlib, and Seaborn to generate statistical summaries and visual insights.
 - **Group Analysis:** PnL summarized by sentiment type to compare average profitability across conditions.
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Results & Insights

Key findings from the analysis include:

- **PnL Distribution:** Trader profitability distributions were compared across different sentiment levels.
- **Behavioral Patterns:** Visualizations revealed Buy/Sell trends under Greed and Fear conditions.
- **Correlation Check:** Weak correlation was observed between the sentiment index and profitability.

- **Emotional Bias:** Traders exhibited behavioral shifts during Greed phases, but this did not necessarily translate to higher profits.
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Conclusion

The analysis concludes that while market sentiment influences **trading behavior**, it does not have a strong correlation with **actual profitability**. Emotional biases play a role in decision-making, but consistent strategies and discipline are required for long-term success.

This highlights the importance of avoiding overreliance on sentiment indices and instead focusing on robust trading strategies backed by data-driven decision-making.