Data Science Assignment Report

Introduction:
This report analyzes trading behavior in relation to overall market sentiment using two datasets: **Historical Trader Data** – Includes details of each trade such as account ID, trade size, leverage, and profit/loss metrics. **Fear & Greed Index** – Captures daily market sentiment classified as Fear, Extreme Fear, Greed, or Extreme Greed. The objective is to uncover patterns between trading activity and sentiment to guide smarter trading strategies.

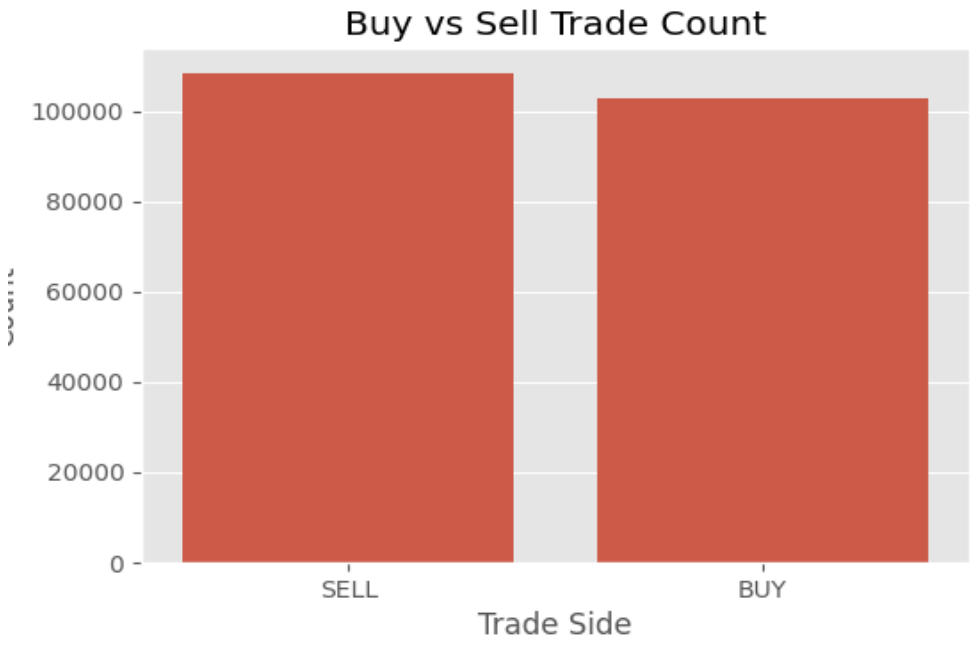
Dataset Overview:
Historical Trader Data: 211,224 trades across 16 columns including Size, Side, Closed PnL, and Fees. **Fear & Greed Index:** 2,644 daily sentiment records with classifications. Datasets were merged on the date field to match trades with corresponding market sentiment.

Data Cleaning Summary:
Converted timestamps to standard datetime format. Standardized categorical fields like **Side** (BUY/SELL) and sentiment classification. Filled missing numeric values such as Closed PnL and Fees with 0. Created a clean merged dataset with 19 columns for analysis.

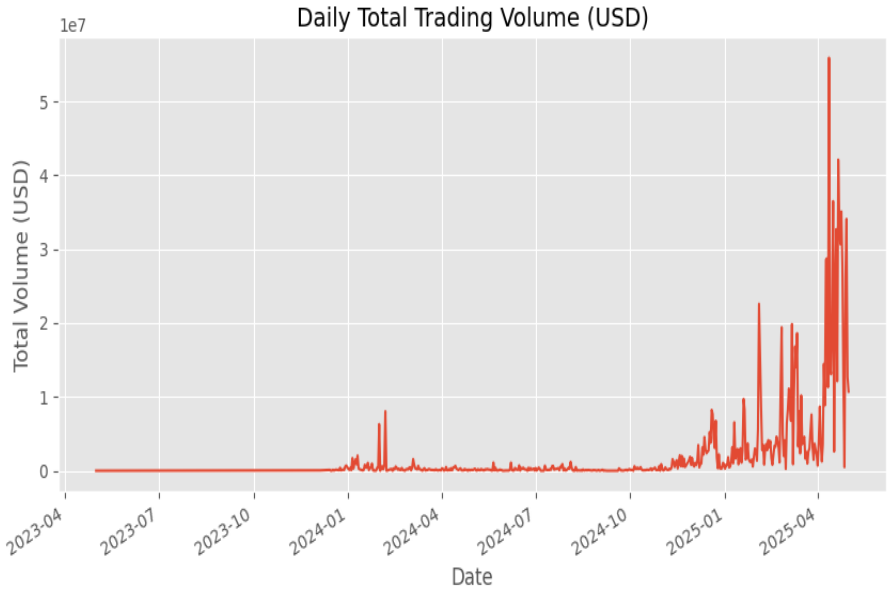
Metric	Value
Total Trades	211,224
Total Volume (USD)	$1.19 Billion
Total Closed PnL	$10.29 Million
Buy Trades	102,696
Sell Trades	108,528

Exploratory Data Analysis (EDA):

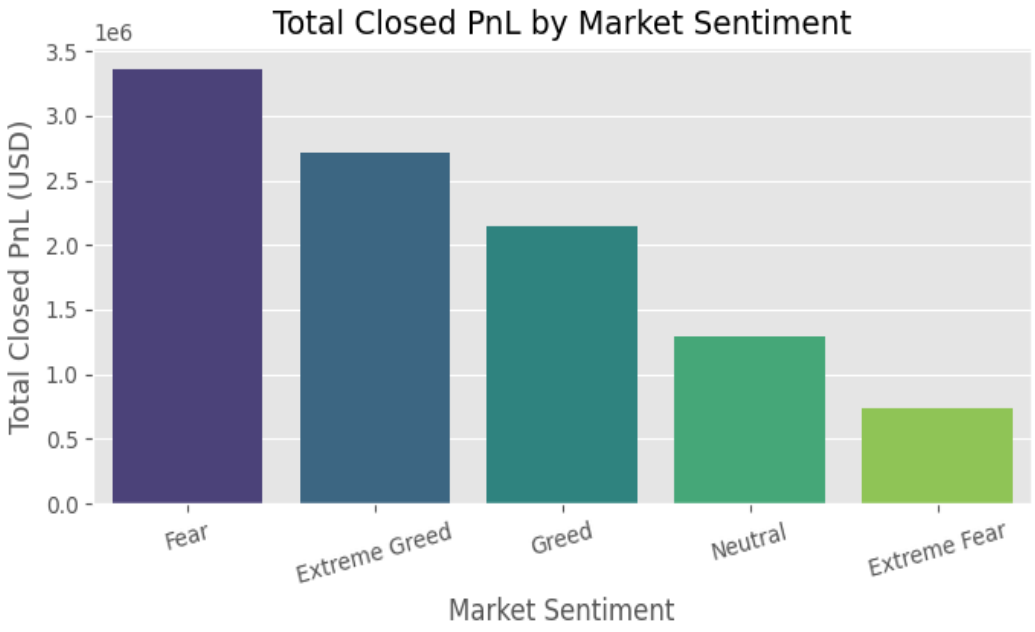
1. Buy vs Sell Trade Count



2. Daily Total Trading Volume



3. Total Closed PnL by Market Sentiment



Profitability vs Sentiment Analysis:
Trades during **Extreme Greed** periods generated the highest total profitability. **Fear periods** had lower average profits and occasional net losses, indicating cautious trading or panic selling. Trading volume was significantly higher during **Greed** and **Extreme Greed**, suggesting strong market participation during optimistic conditions. This behavior implies traders take larger and more aggressive positions during optimistic sentiment phases.

Final Insights and Recommendations:
Capitalize on high sentiment periods, such as Extreme Greed, for potential higher profits. Develop risk management strategies to reduce losses during Fear and Extreme Fear conditions. Integrate leverage analysis and machine learning for predictive trade modeling in future work.