FINAL REPORT

Data Science Mini Project — Trade PnL & Sentiment Analysis
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1. Objective

The goal of this project was to analyse how *market sentiment* (measured via Fear–Greed Index) affects **daily trading performance (PnL)**.
The analysis includes:

- Daily PnL summarization
- Sentiment vs PnL relationship
- Lag correlation analysis
- Feature importance modelling
- A simple sentiment-based trading strategy

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2. Datasets Used

1. historical_data.csv

Contains raw individual trades with timestamps and PnL.

2. fear_greed_index.csv

Contains sentiment classification (Fear, Neutral, Greed) per day.

3. daily_trade_sentiment_summary.csv

Generated from Notebook 1 — aggregated daily-level performance dataset.

4. toy_strategy_sentiment.csv

Generated in Notebook 2 for backtesting.

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3. Key Visualizations

3.1 PnL vs Sentiment (Notebook 1)

Shows how daily PnL fluctuates with sentiment cycles.

(plot: pnl_vs_sentiment.png)

3.2 Boxplot — PnL by Sentiment

Shows the distribution of daily PnL across Fear, Neutral, Greed groups.

(plot: boxplot_sentiment_pnl.png)

3.3 Lag Correlation

Shows correlation between sentiment and PnL across ±30 day lags.

(plot: lag_correlation.png)
Insight: Weak/low lag correlation → sentiment alone does not predict PnL.

3.4 Feature Importance (RandomForest)

Ranked most important predictors of daily PnL.

(plot: feature_importance.png)

3.5 Smoothed Trends (7-day MA) — Notebook 2

Shows trend alignment between sentiment and PnL.

(plot: smoothed_trends.png)

3.6 Correlation Heatmap

Shows relationships across numeric features.

(plot: correlation_heatmap.png)

3.7 Toy Backtest: Sentiment-Lag Strategy

Simple rule:
"If sentiment yesterday > 0.5 → go long today."

(plot: toy_backtest_sentiment.png)

Insight:
Strategy performs similarly or worse than buy-and-hold → sentiment alone is not a strong alpha source.

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4. Conclusions

- Daily PnL has **no strong direct dependency** on sentiment.
- Lag correlation results show **no predictive edge** in using sentiment alone.
- RandomForest feature importance shows **trade-specific metrics (count, avg_pnl)** matter more than sentiment.
- Simple sentiment trading strategy produces **weak or inconsistent returns**.
- Sentiment may be useful combined with volatility or trend signals, but not standalone.