📄 Data Science Report

Project Title: Trader Behavior vs. Market Sentiment
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Colab Notebook Link: [Insert your Colab link here]

1. Objective

This project analyzes how trader behavior varies across different market sentiment conditions — including Fear, Greed, Extreme Fear, Extreme Greed, and Neutral. The goal is to uncover behavioral patterns in profitability, trade direction, risk exposure, and cost sensitivity using real trade and sentiment data.

2. Data Sources

- **trader_data.csv**: Contains individual trade records including PnL, trade size, fees, and direction.
- **sentiment_data.csv**: Daily market sentiment classification (e.g., Fear, Greed).

3. Methodology

- Cleaned and standardized column names
- Parsed timestamps and aligned trade dates with sentiment dates
- Merged datasets on date
- Grouped and analyzed trades by sentiment classification
- Visualized PnL distribution and trade direction
- Summarized average trade size and fees

4. Key Findings

📉 Trader Profitability by Sentiment

✅ Traders perform best during **Extreme Greed**, while **Greed** and **Fear** carry high volatility and risk.

📊 Trade Side Distribution

✅ SELL trades dominate during Fear and Extreme Fear, while BUY trades rise during Greed and Extreme Greed.

💰 Average Trade Size and Fees

✅ Traders risk more and pay higher fees during Fear and Greed, suggesting aggressive strategies.

5. Visuals

Include the following charts from your outputs/ folder:

- pnl_by_sentiment.png: Scatter plot of PnL distribution
- trade_side_by_sentiment_annotated.png: Bar chart with trade counts and annotations

6. Conclusion

Market sentiment significantly influences trader behavior.

- **Extreme Greed** drives profitability
- **Fear** triggers high-volume, high-risk trading
- **Neutral** sentiment leads to cautious, consistent strategies
- **Greed** is deceptive — high volatility with lower returns

These insights can inform trading strategies, risk management, and behavioral modeling in Web3 markets.