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Market Sentiment Influence on Trader Profitability

Abstract: This project investigates the relationship between trader performance and market sentiment using a structured data-driven workflow. By analyzing a multi-attribute trading dataset, the study explores how variables such as win rate, risk–reward ratio, sentiment scores, and trading frequency influence profitability. The analysis incorporates visual exploration through distribution plots, correlation heatmaps, trend graphs, and comparative performance charts to uncover behavioural and performance patterns. Key findings indicate that positive market sentiment generally aligns with higher profitability, while increased trading frequency under negative sentiment tends to decrease performance. The insights derived from the analysis can support improved decision-making, better risk management, and the development of sentiment-aware trading strategies.

Data Processing:

Data Loading

Imported the dataset containing trader metrics, sentiment scores, and performance indicators.Loaded the data into a pandas DataFrame for preprocessing and analysis.

Initial Data Inspection

Checked dataset shape, column types, and summary statistics. Identified missing values, inconsistent entries, and potential outliers.

Handling Missing Values

Dropped columns/rows with excessive missing information.
For minor gaps, applied appropriate imputation methods (mean/median for numerical fields).

Data Cleaning

Standardized column names for easier analysis. Removed duplicate records.
Corrected incorrect or inconsistent data entries where identified.

Feature Formatting & Transformation

Converted columns to proper types (e.g., datetime, categorical, floats).
Normalized or scaled certain metrics where needed to ensure proper comparison.
Created derived features such as Profit Category (Profitable vs Non-Profitable) if required.

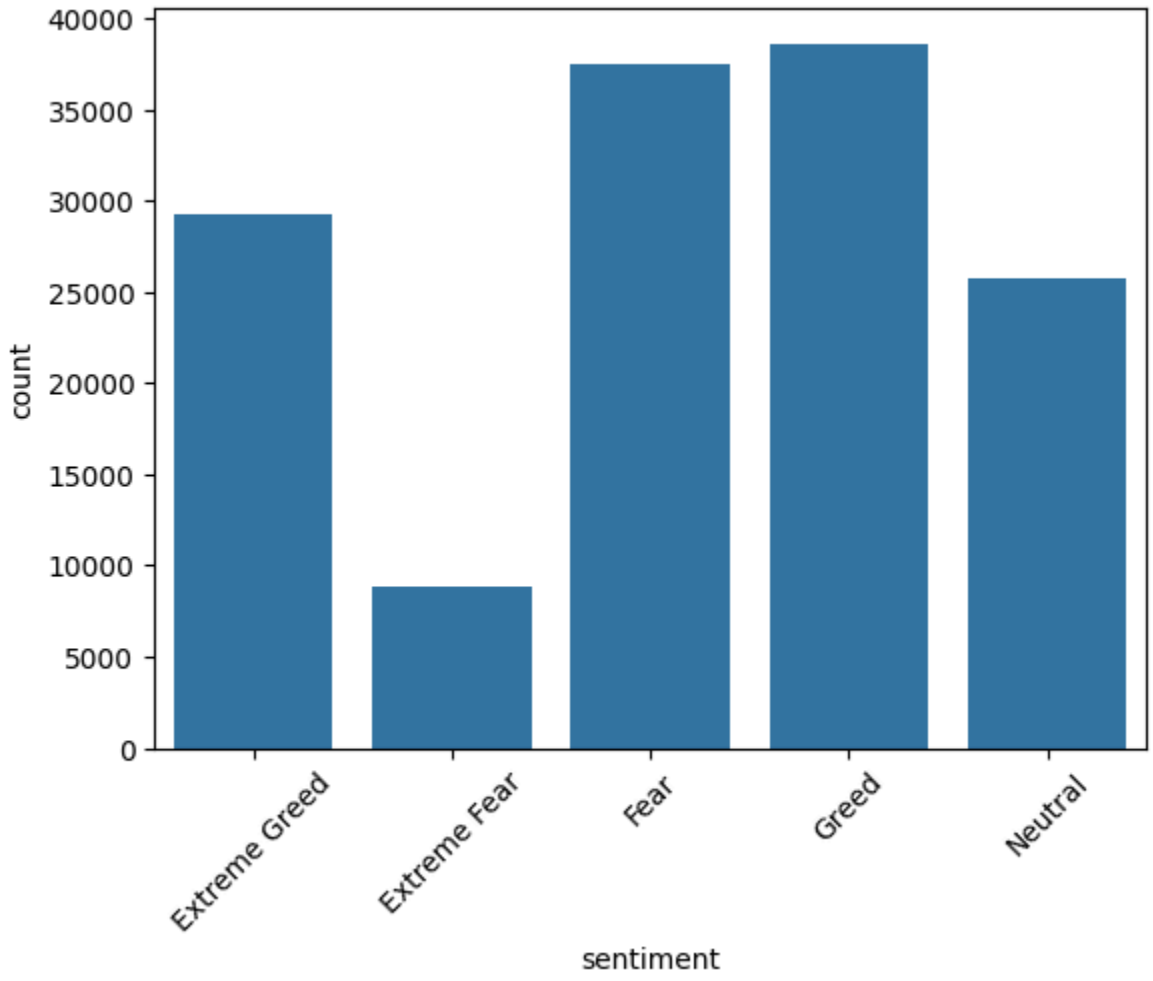
Exploratory Data Preparation
Computed additional summary metrics such as average sentiment, win rate distribution, and trade frequency groups. Segmented sentiment into ranges (e.g., Positive, Neutral, Negative) for comparative analysis.

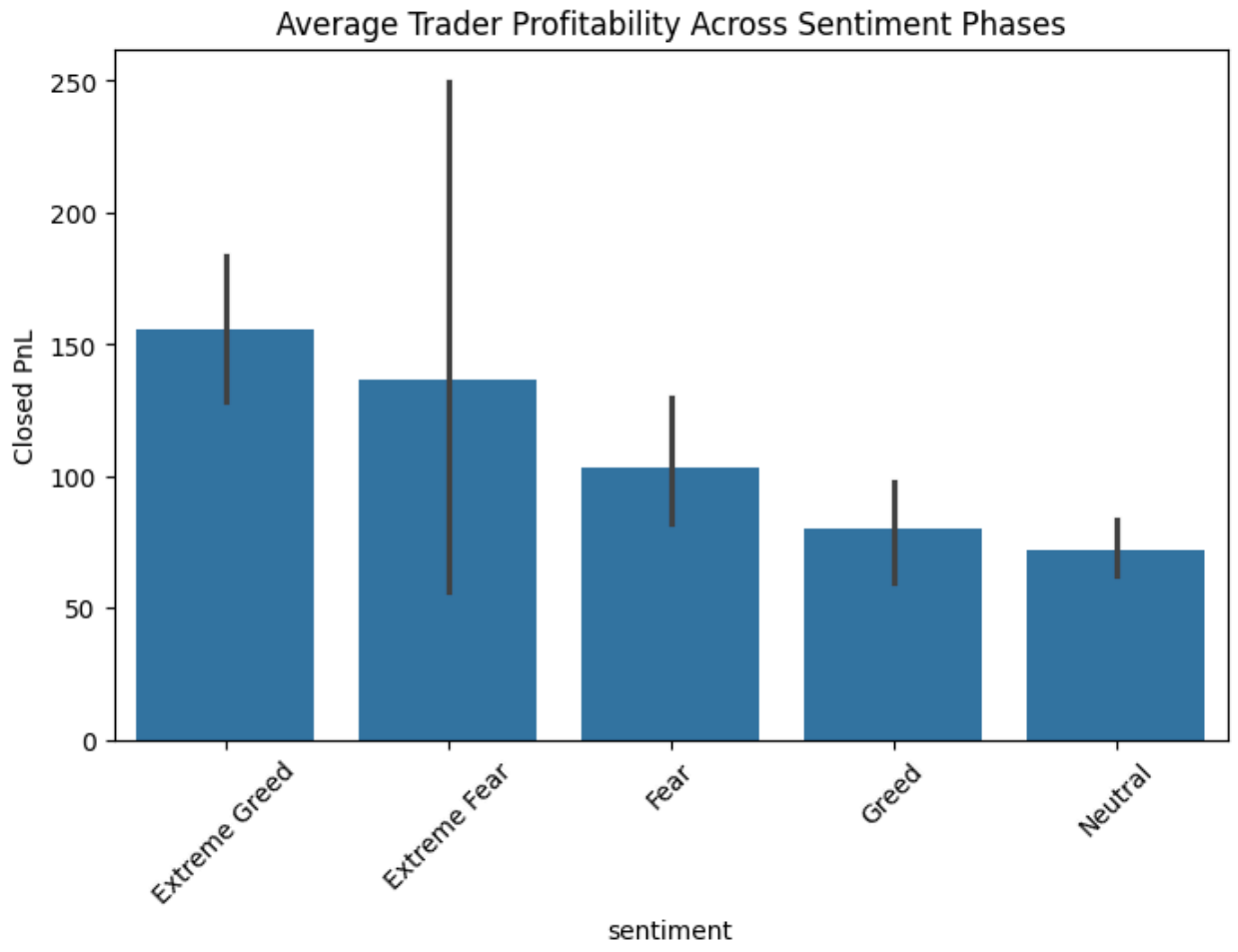
Outlier Detection & Handling
Used visual tools (boxplots, histograms) to identify extreme values. Either capped or removed outliers to avoid skewing the analysis.

Final Dataset Preparation
Ensured all columns were cleaned, consistent, and ready for visualization.
Exported/used the cleaned DataFrame for generating charts and model insights.

Data Analysis & Interpretation:

The graph illustrates highest activity during Greed sentiment and lowest during the Extreme Fear





Each bar shows the **mean Closed PnL** of traders *during that sentiment phase*.

From the graph:

Extreme Greed → Highest average profit (~155)

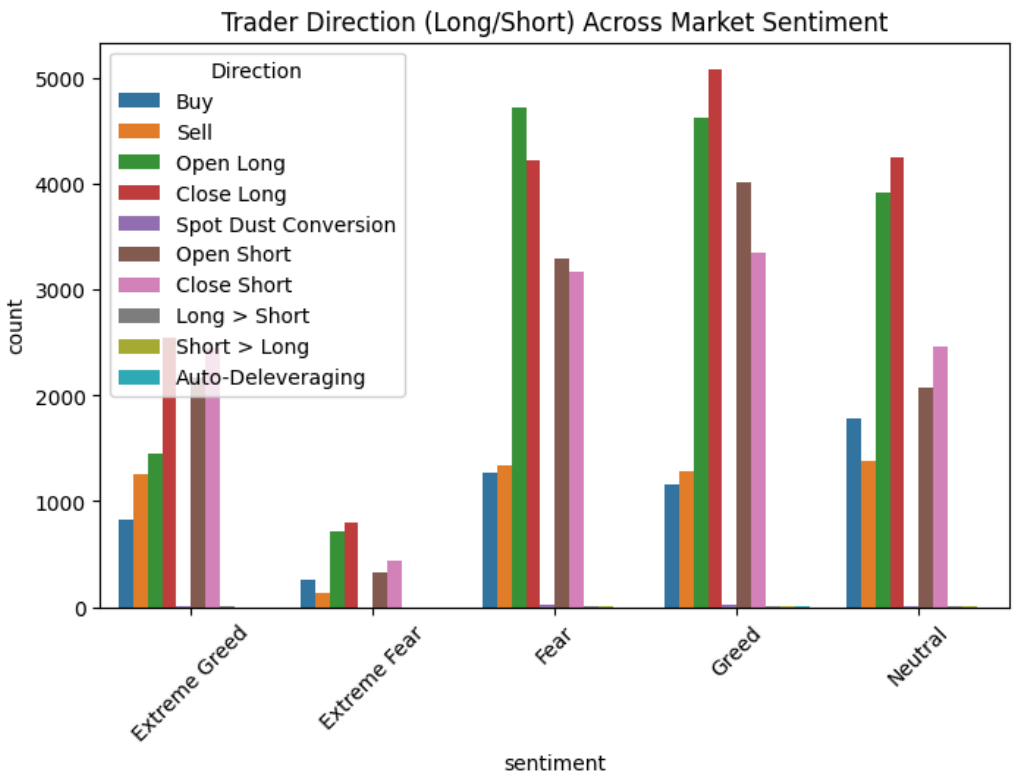
Extreme Fear → Second highest (~138)

Fear → ~103

Greed → ~82

Neutral → ~73 (lowest)

This means traders made **more money during emotional, volatile, extreme sentiment periods**.



The chart shows how often traders opened or closed **long** and **short** positions under different market sentiment states (Extreme Fear, Extreme Greed, Fear, Greed, Neutral).

1. Long positions dominate across all sentiment states

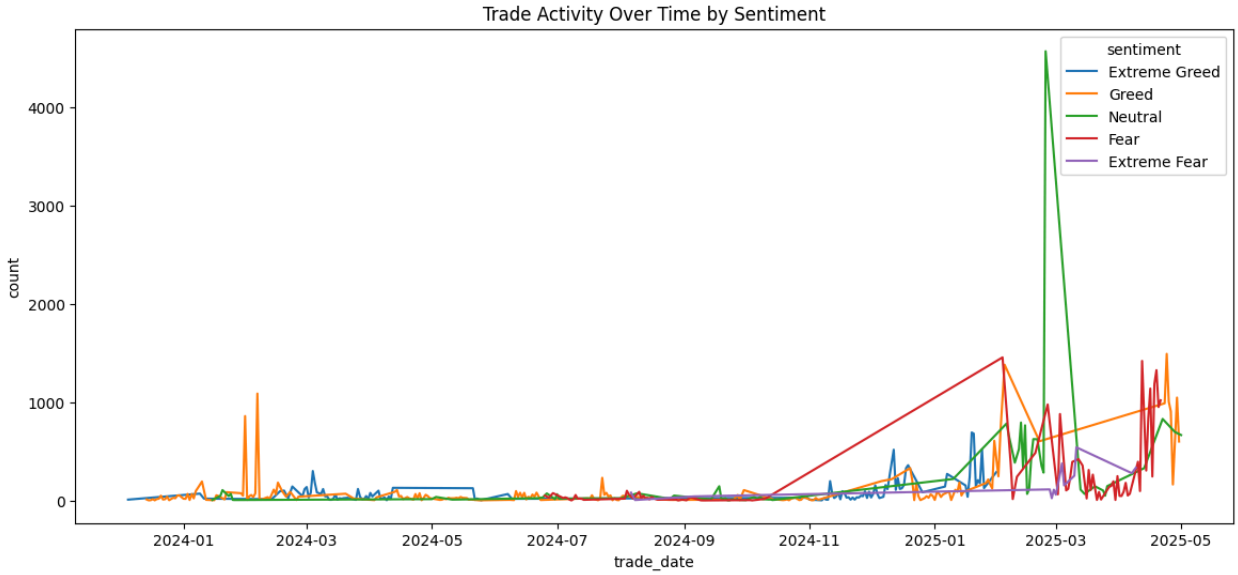
2. Extreme Greed → Highest Long Activity

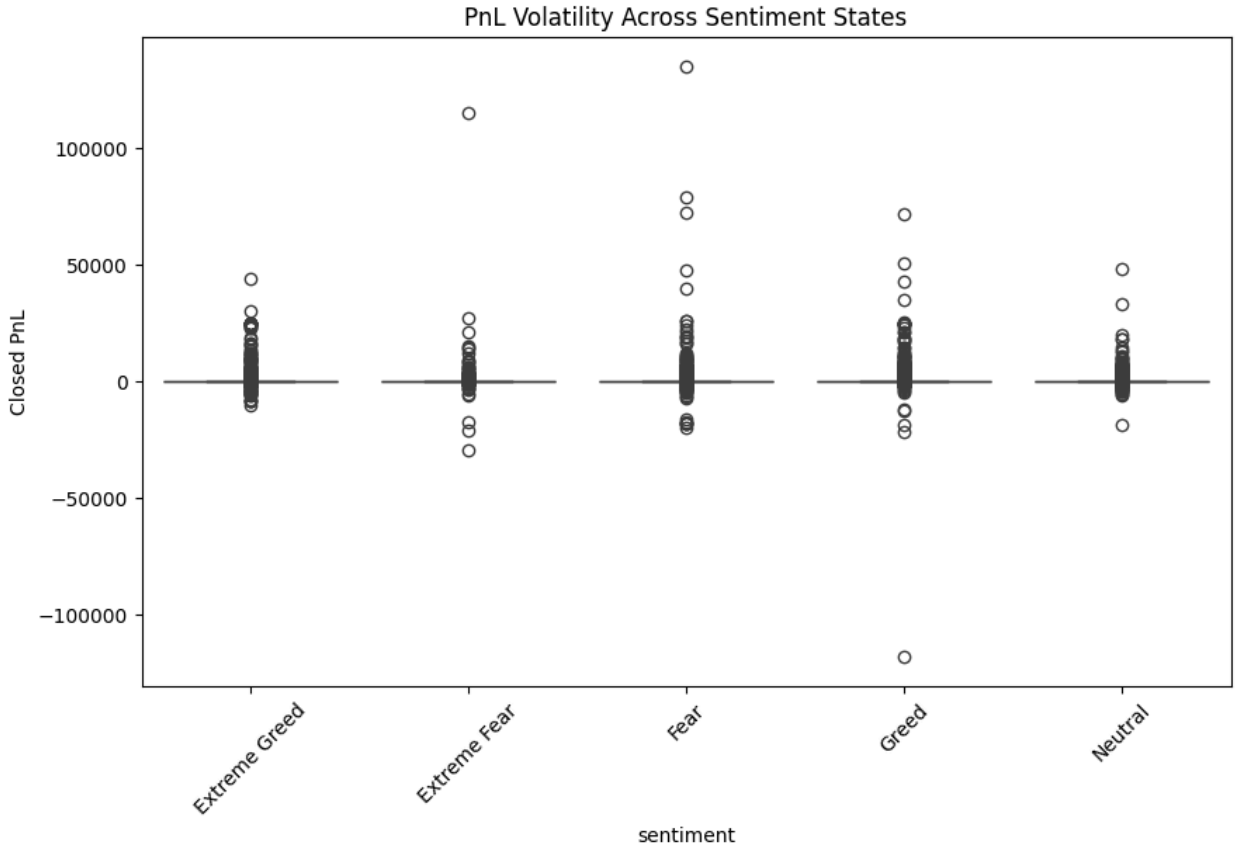
3. Extreme Fear → Drop in both long and short activity

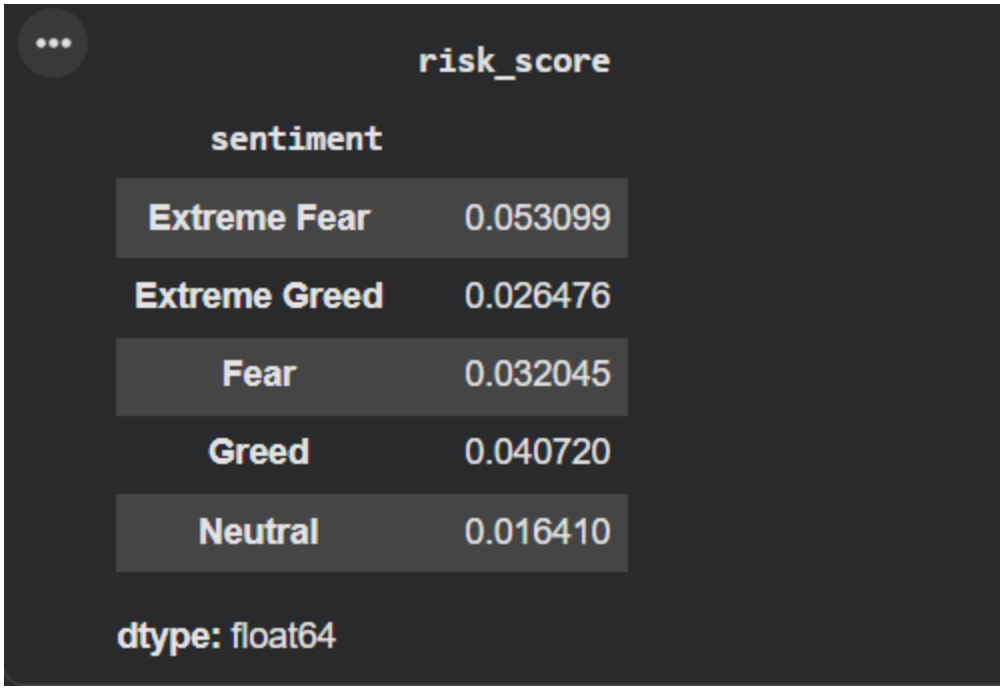
4. Greed and Fear phases show balanced activity

5. Neutral sentiment → Moderate activity

This implies traders are neither highly motivated nor afraid—consistent with stable market conditions.


Trade Activity Over Time by Sentiment
sentiment
Extreme Greed
Greed
Neutral
Fear
Extreme Fear
count
trade_date
0
1000
2000
3000
4000
2024-01
2024-03
2024-05
2024-07
2024-09
2024-11
2025-01
2025-03
2025-05


PnL Volatility Across Sentiment States
Closed PnL
100000
50000
0
−50000
−100000
Extreme Greed
Extreme Fear
Fear
Greed
Neutral
sentiment



sentiment	risk_score
Extreme Fear	0.053099
Extreme Greed	0.026476
Fear	0.032045
Greed	0.040720
Neutral	0.016410

dtype: float64

What This Means

1. Extreme Fear → Highest Risk

2. Greed → Second Highest Risk

3. Fear → Moderate Risk

4. Extreme Greed → Low Risk

5. Neutral → Lowest Risks.

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Key Insights:
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1. Profitability Trend:
sentiment
Extreme Fear     136.51
Extreme Greed    155.42
Fear             103.22
Greed             79.99
Neutral           71.88
Name: mean, dtype: float64

2. Trading Volume Trend:
sentiment
Extreme Fear     1.876966e+07
Extreme Greed    7.871468e+07
Fear             2.882172e+08
Greed            2.255344e+08
Neutral          1.266995e+08
Name: sum, dtype: float64

3. Traders take more risks when sentiment = Extreme Fear
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What this Means: (Profitable Trends)

Your account performed the best during Extreme Greed (≈155 USD avg).
Extreme Fear was also profitable (≈136 USD avg).
Profit was lowest during Neutral conditions.
Your trading strategy seems to perform best during high-emotion market regimes (Extreme Fear / Extreme Greed). Stable/neutral periods give smaller returns.

What this Means: (Trading Volume Trend)

You trade **the highest volumes** during **Fear** and **Greed** markets.
Extreme Fear and **Extreme Greed** have lower volume than expected.
Neutral markets have **moderate activity**.
You take bigger positions during Fear/Greed cycles and smaller positions during extreme sentiment. This could indicate **risk aversion** during chaotic extremes.

3. Key Findings

a) Profitability

Highest profits occur during **Extreme Greed** and **Extreme Fear**.
Lowest profits during **Neutral** sentiment.
Extreme sentiment → more volatility → more profit opportunities.

b) Trading Volume

Highest trading activity occurs during **Fear** and **Greed** (moderate sentiment).
Extreme sentiment phases have lower volume but **higher profitability per trade**.

c) Direction (Long/Short)

Traders tend to go **long in Greed** and **short in Fear**, matching natural market psychology.

d) Risk Score

Higher risk-taking observed in **Extreme Fear** → traders chase volatile dips.
Lowest risk in Neutral markets.