

Trader Performance Analysis Across Market Sentiment Regimes

1. Problem Statement

Financial markets are heavily influenced by investor sentiment, commonly categorized into regimes such as **Fear**, **Greed**, and **Extreme conditions**. While sentiment indicators are widely tracked at the market level, it remains unclear how **individual trader performance** varies across these sentiment regimes.

This project aims to analyze whether trader behavior, profitability, risk-taking, and consistency differ under varying market sentiment conditions using historical trade execution data aligned with the **Fear & Greed Index**.

2. Objective

The primary objectives of this analysis are:

- To study the distribution of trades across different market sentiment regimes
 - To evaluate how trader performance metrics change under Fear vs Greed markets
 - To analyze the relationship between **risk and return** across sentiment regimes
 - To identify **top-performing traders** under each sentiment condition
 - To detect **contrarian traders** who outperform during Fear-driven markets
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3. Key Questions

1. How is market sentiment distributed across the dataset?
2. Do traders behave differently under different sentiment regimes?
3. Is higher return accompanied by higher risk?

4. Who performs best under each sentiment regime?
 5. Are there traders who outperform during Fear markets?
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4. Scope of Analysis

- Trade-level historical execution data
 - Daily Fear & Greed Index sentiment classification
 - Analysis conducted at **trader × sentiment regime** level
 - Sentiment treated as a **contextual market regime**, not a predictive intraday signal
 - No predictive modeling — focus on **descriptive and behavioral insights**
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5. Methodology & Feature Engineering

Data Preparation

- Aligned intraday trades to daily sentiment using calendar date
- Preserved all trade records using a **left join** strategy

Engineered Features

- **Net PnL** (including fees)
- **Win rate**
- **Average PnL per trade**
- **PnL volatility (risk proxy)**
- **Average trade size**
- **Sharpe-like risk-adjusted prox**

Aggregation Level

All metrics were aggregated at : **Trader Account × Sentiment Regime**

6. Analysis & Visualizations

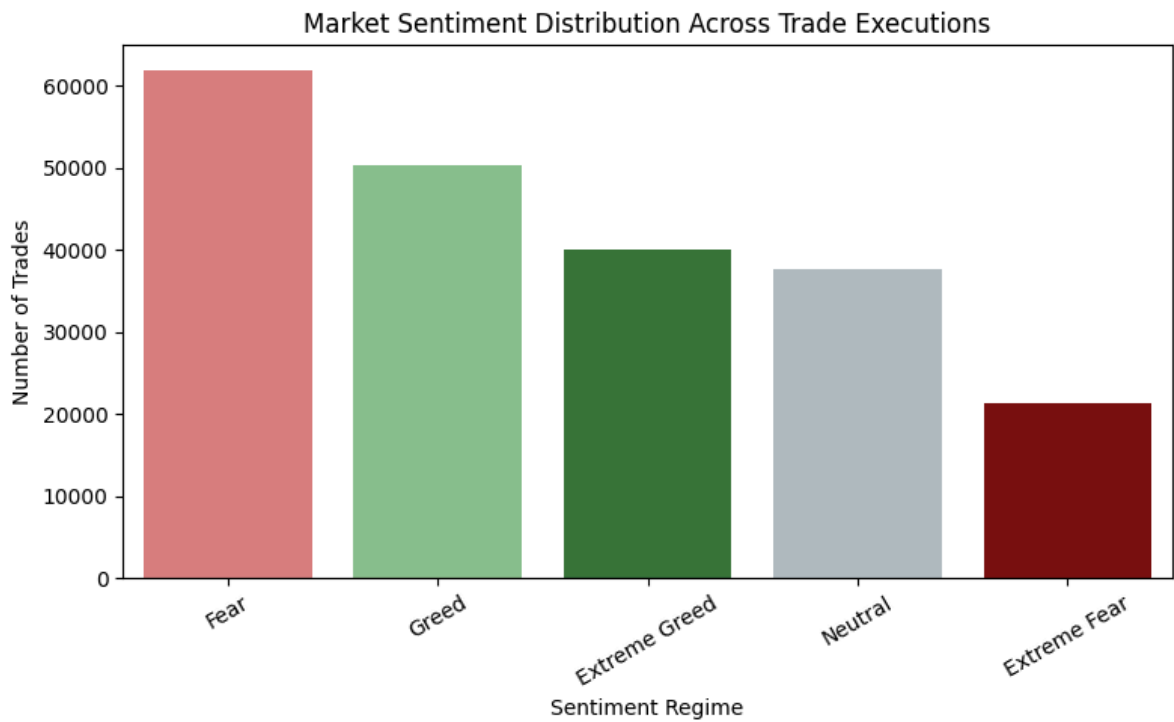
Q1. How is market sentiment distributed across the dataset?

Insight:

The dataset covers a broad range of sentiment regimes, with substantial representation across Fear, Greed, Neutral, and Extreme conditions. This balanced coverage allows for meaningful comparative analysis of trader behavior across different market environments.

Visualization:

Sentiment Distribution Across Trade Executions



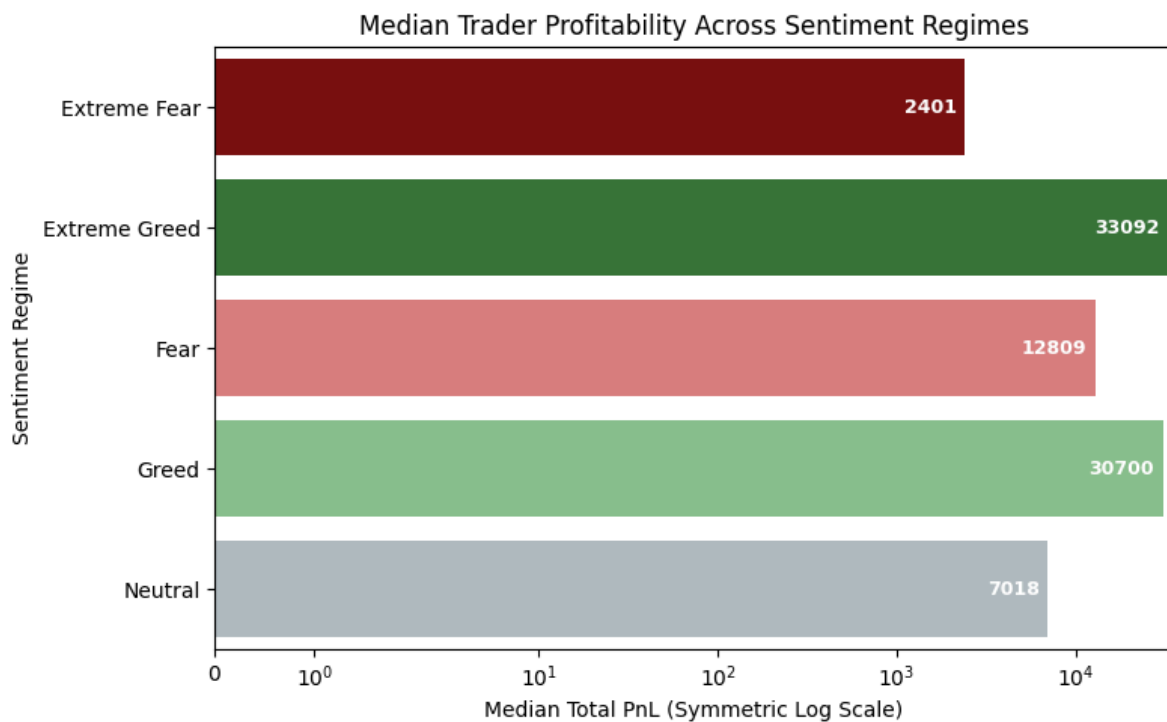
Q2. Do traders behave differently under different sentiment regimes?

Insight:

Median trader profitability is notably higher during **Greed** and **Extreme Greed** regimes, indicating increased risk-taking and opportunity exploitation. In contrast, **Fear** and **Extreme Fear** regimes exhibit lower median profitability, suggesting more cautious or constrained trading behavior.

Visualization:

Median Trader Profitability by Sentiment Regime



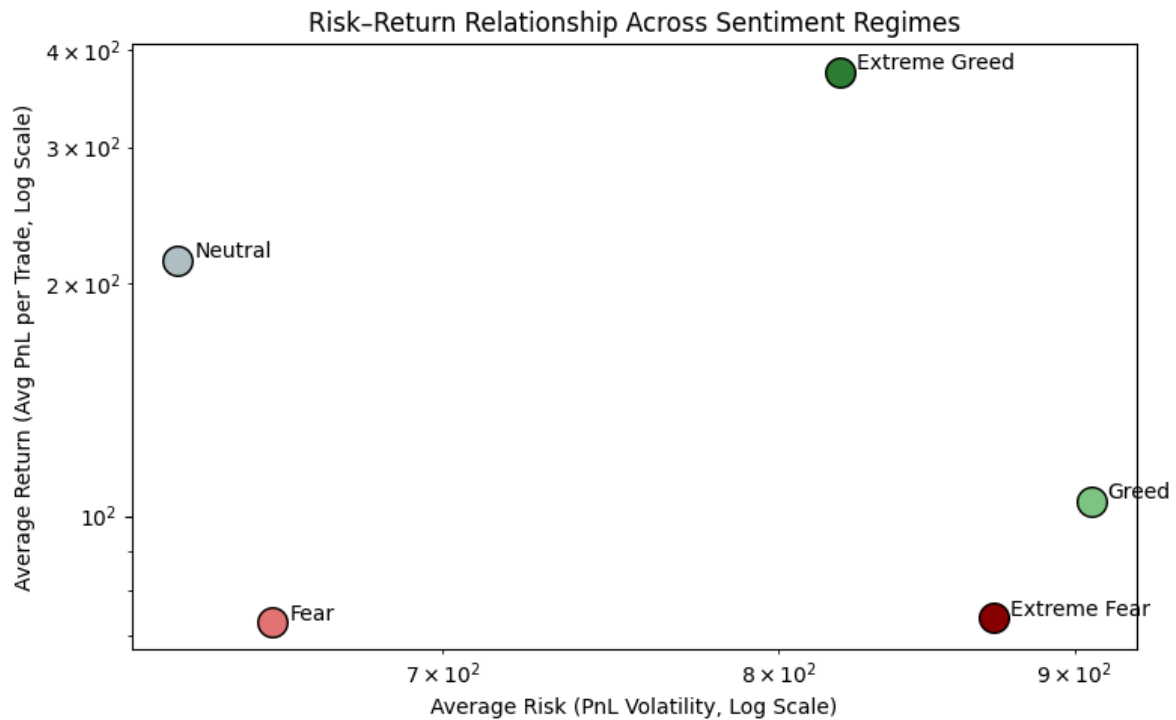
Q3. Is higher return accompanied by higher risk?

Insight:

There is a clear positive relationship between average return and risk. Greed-driven regimes show higher returns accompanied by increased volatility, while Fear regimes exhibit more conservative risk–return profiles. This confirms the classic risk–return tradeoff in trader behavior.

Visualization:

Risk–Return Relationship Across Sentiment Regimes



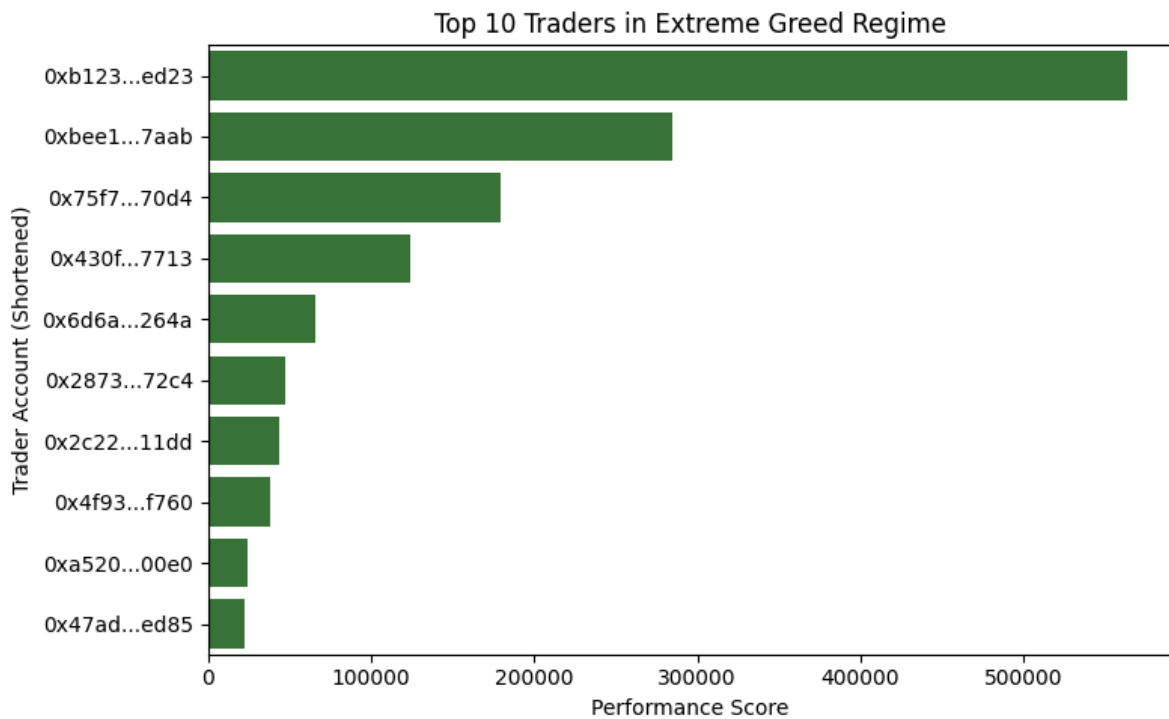
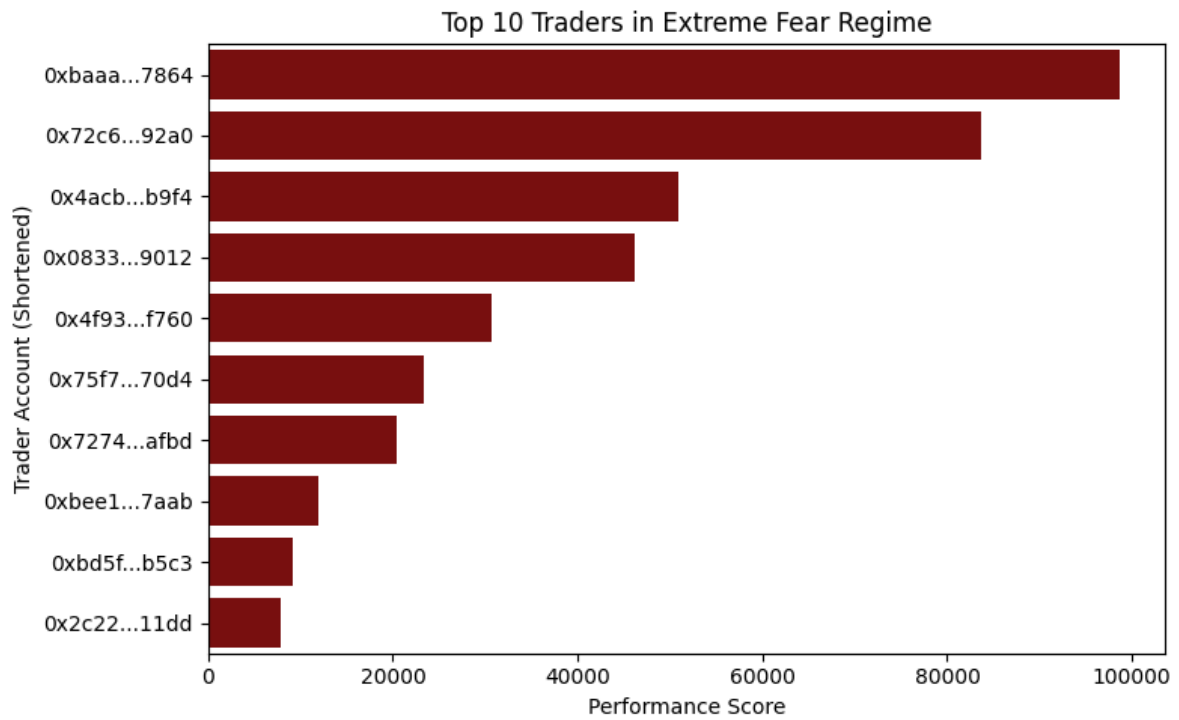
Q4. Who performs best under each sentiment regime?

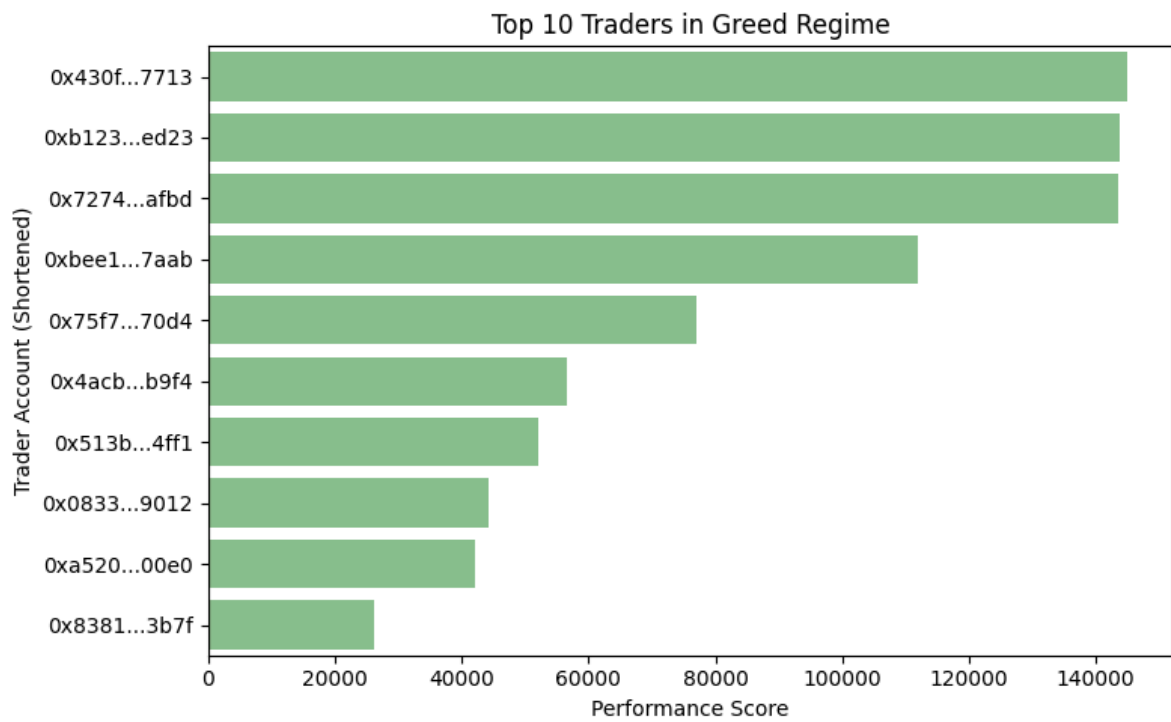
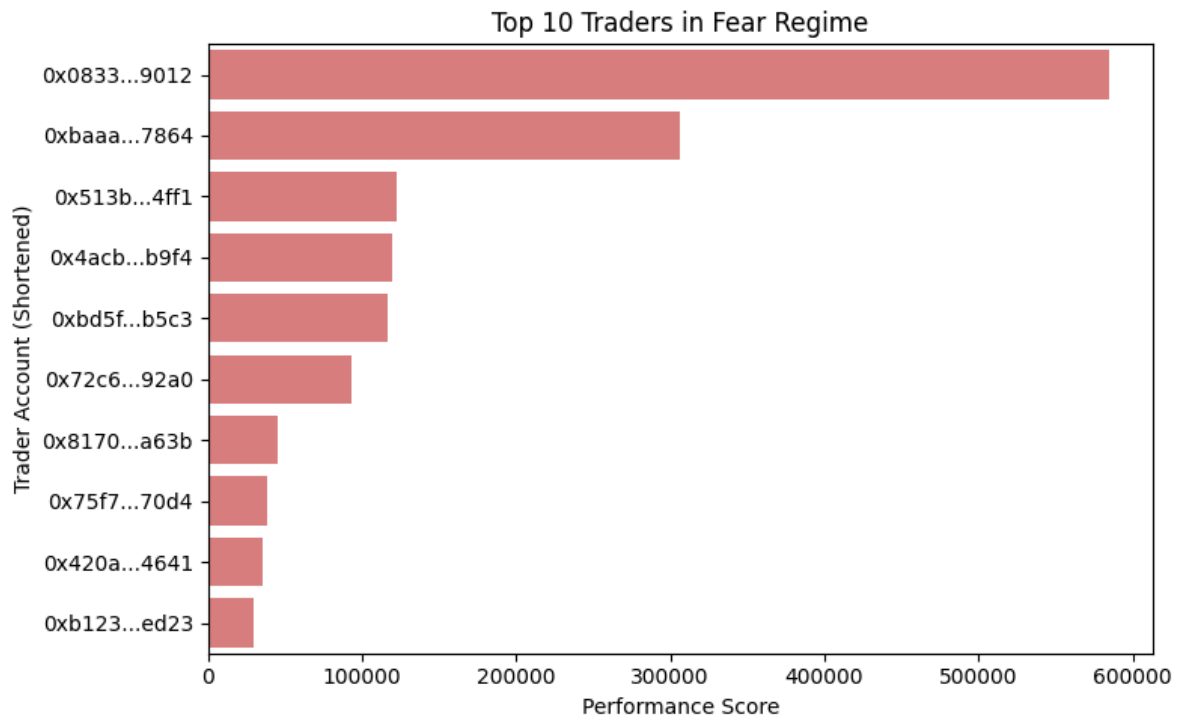
Insight:

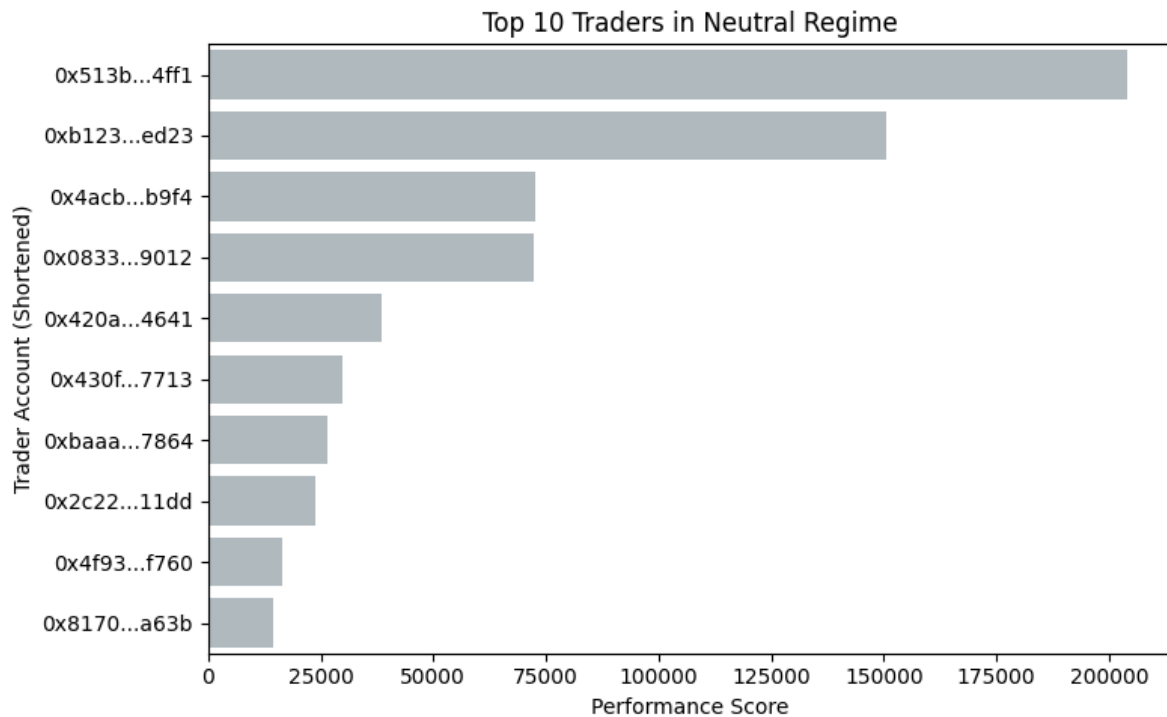
Top-performing traders differ significantly across sentiment regimes. Traders who rank highly during Greed markets are often not the same traders who dominate Fear or Neutral conditions, highlighting that **trading performance is context-dependent rather than universally consistent**.

Visualizations:

- Top 10 Traders in Extreme Fear
- Top 10 Traders in Extreme Greed
- Top 10 Traders in Fear
- Top 10 Traders in Greed
- Top 10 Traders in Neutral







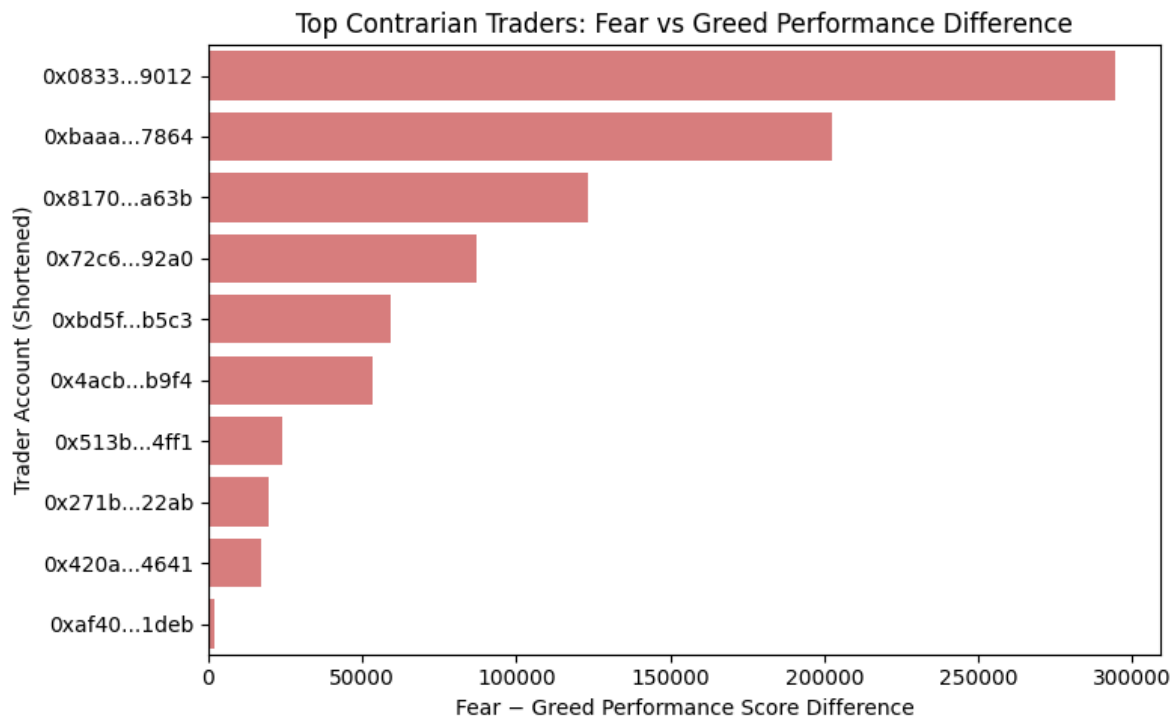
Q5. Are there traders who outperform during Fear markets?

Insight:

A subset of traders demonstrates stronger performance during Fear markets compared to Greed markets. These traders may exhibit **contrarian behavior**, capitalizing on market stress and inefficiencies when overall sentiment is pessimistic.

Visualization:

Fear vs Greed Performance Difference — Contrarian Traders



7. Overall Takeaways

- Trader behavior and performance vary significantly across sentiment regimes
- Greed markets are associated with higher returns and higher risk
- Fear markets encourage more conservative trading behavior
- No single trader dominates across all sentiment conditions
- Identifying regime-specific and contrarian traders can provide valuable strategic insights

This analysis demonstrates how market sentiment acts as a **contextual regime** influencing trader behavior rather than a short-term predictive signal.