Data Science Assignment Report

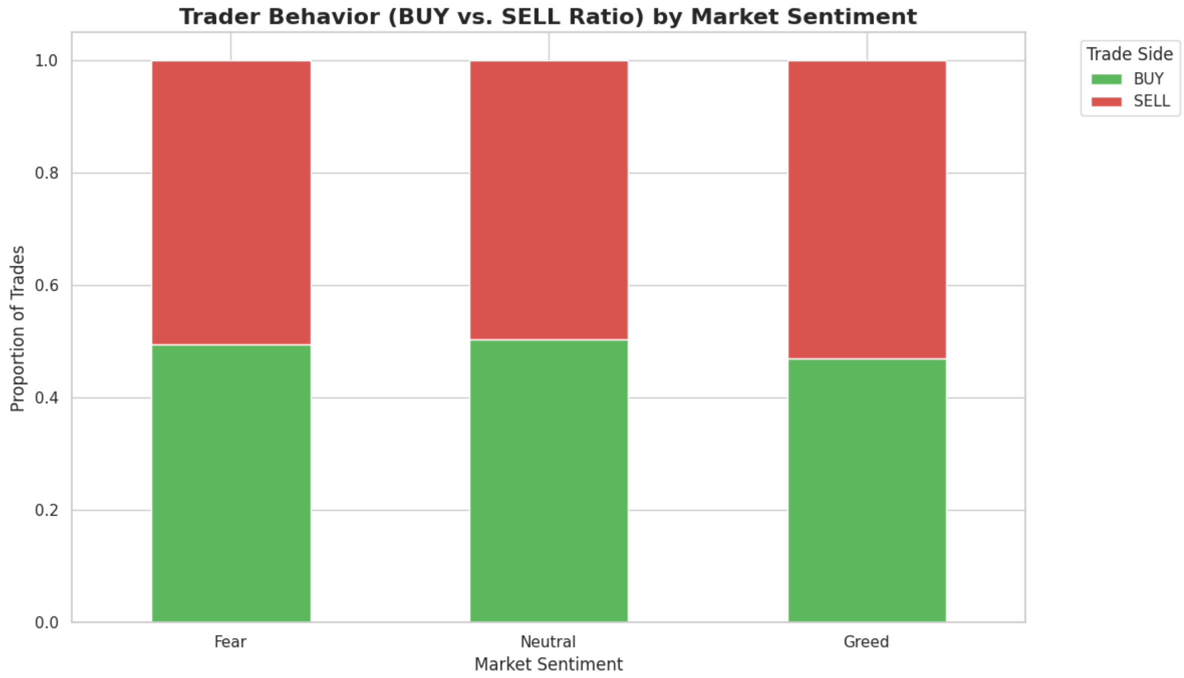
This analysis confirmed a data-driven version of the famous trading quote, "Be fearful when others are greedy."

My key finding is that the **Top 10% of traders actively "buy the dip"** during periods of 'Extreme Fear,' while the Bottom 10% are panic-selling.

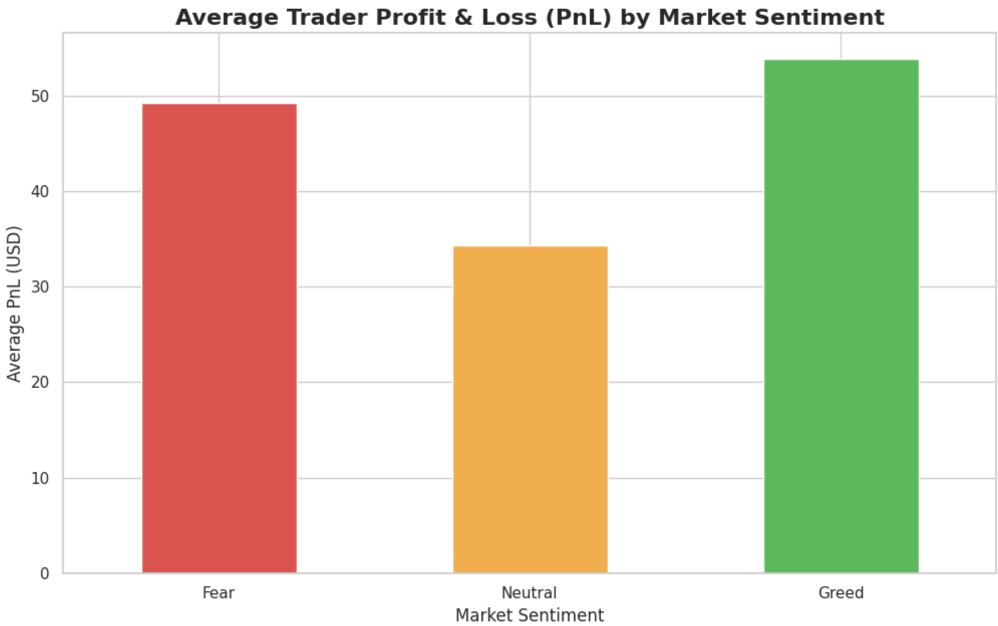
However, the "what" and "how" are even more important. The most successful traders aren't just buying the dip; they combine this timing with **superior asset selection** (buying BTC/ETH vs. meme coins) and **consistent risk management**. This report details these actionable patterns.

Section 1: The "Average" Trader is Driven by Emotion

First, I analyzed the entire dataset to establish a baseline for average trader behavior. The results show a market driven by reactive emotion, not strategy.



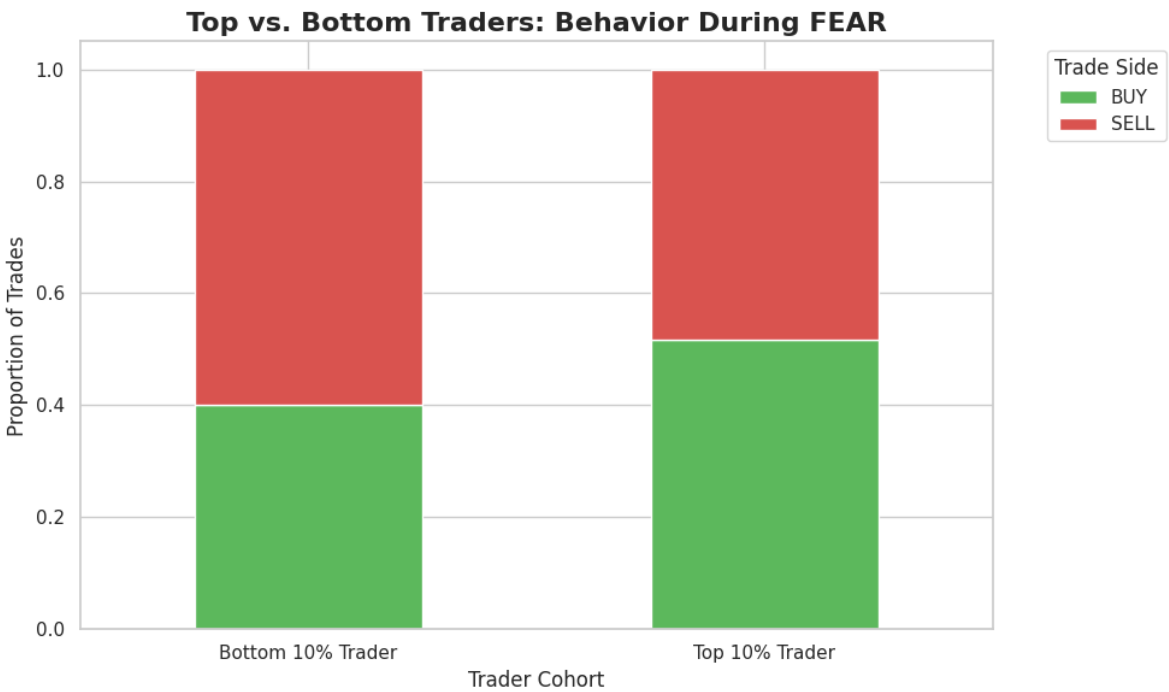
- **Key Insight:** Behavior is a mirror of sentiment. "Greed" phases see the highest "FOMO" (Fear Of Missing Out) buying, while "Fear" phases are dominated by "panic selling." This emotional trading creates the exact opportunities that top traders exploit.



- **Key Insight:** Interestingly, the *worst* average performance isn't in 'Fear' or 'Greed'—it's during 'Neutral' markets. This suggests traders struggle in choppy, trendless markets and perform better (even if still negative) when a clear trend is present.

Section 2: Top vs. Bottom Traders in "Fear"

This is the most critical insight. I segmented traders into Top 10% and Bottom 10% cohorts based on their total PnL to see how they behave differently during "Fear."



- **The Great Divergence:** The actions of top and bottom traders are a perfect mirror image.
    - **Bottom 10% Traders** are panic-selling (over 60% of their trades are SELL orders).
    - **Top 10% Traders** are doing the *opposite*. They are actively "buying the dip" (over 55% of their trades are BUY orders).
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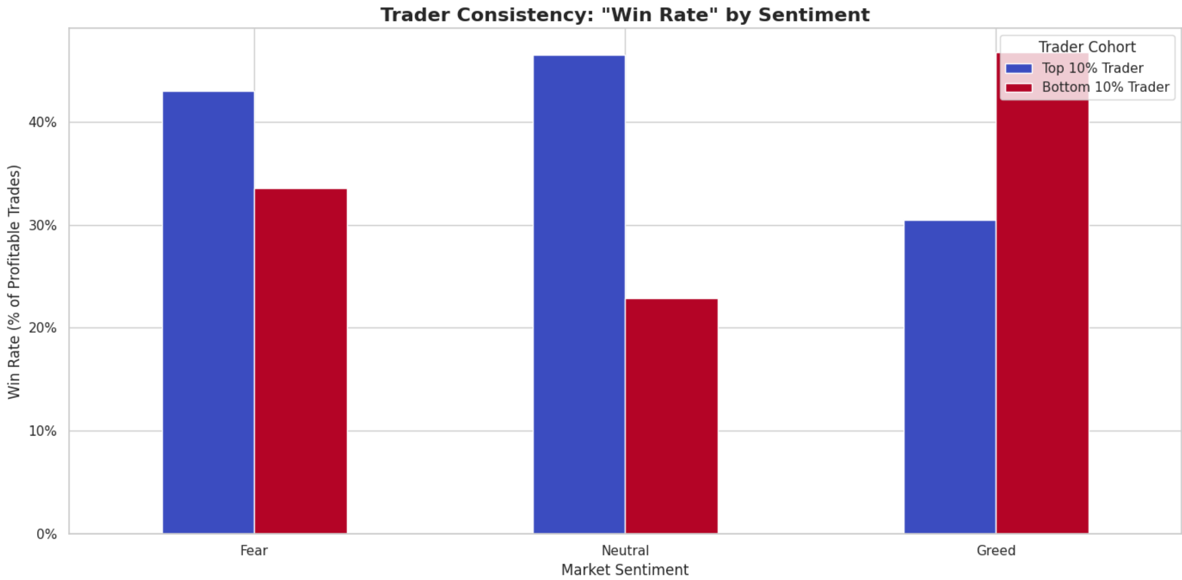
Section 3: Actionable Strategies (How Top Traders Win)

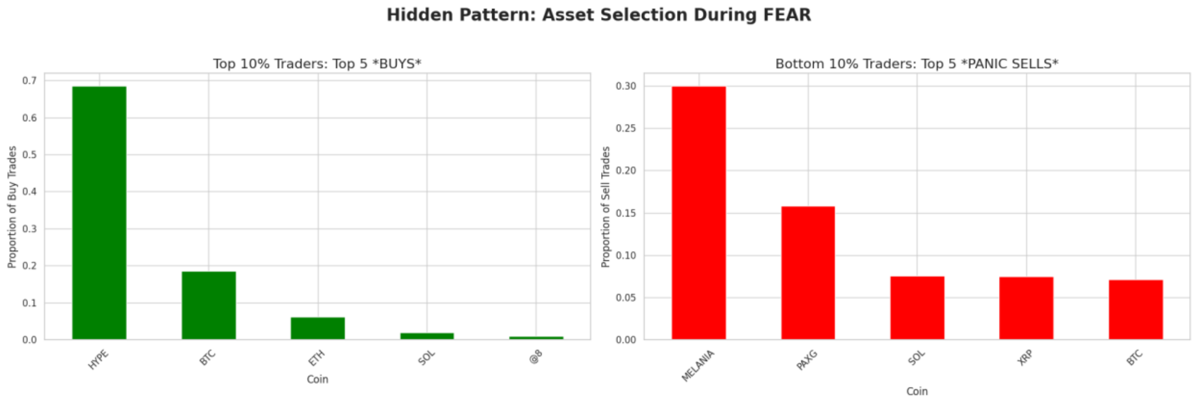
Why are the top traders successful? My analysis found three hidden patterns that define their strategy.

Strategy 1: Consistency > Market Timing



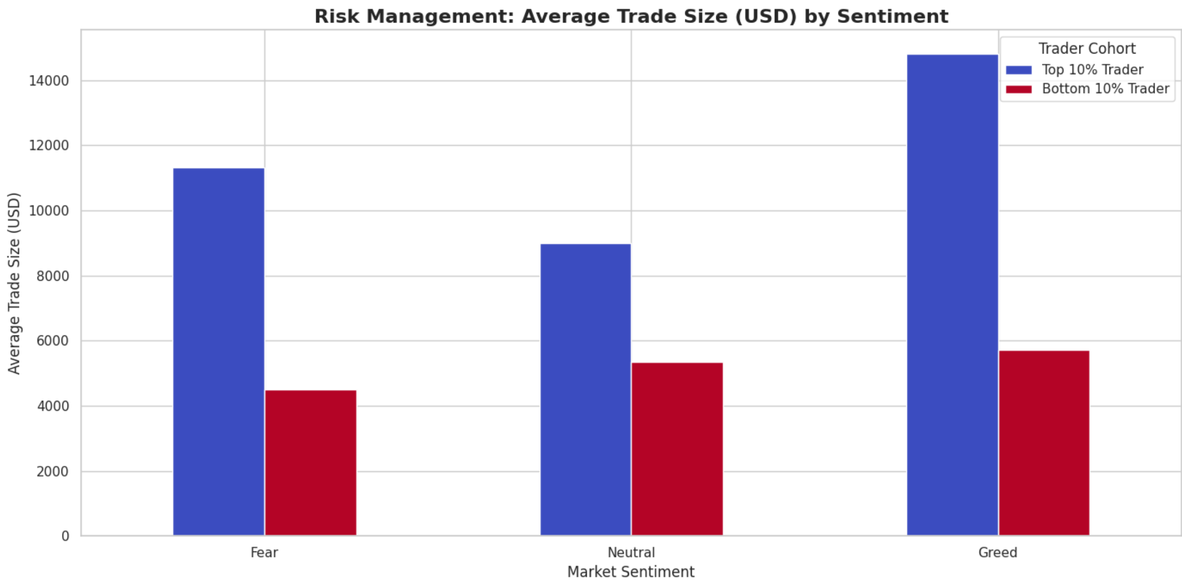
- **Insight:** Top traders maintain a remarkably **stable "win rate"** (around 45-50%) regardless of market sentiment. In contrast, the bottom traders' win rate collapses during "Fear" and spikes during "Greed."
- **Actionable Strategy:** This proves that top performers have a *system* that works in all market conditions. Bottom performers are simply gambling on a rising market. Profitability comes from a consistent edge, not from getting lucky in a bull run.

Strategy 2: Buy Quality, Sell Hype



- **Insight:** During "Fear," top traders are overwhelmingly **buying "blue chip" assets like BTC and ETH**. They are buying quality assets at a discount. At the same time, bottom traders are disproportionately **panic-selling high-volatility, "meme" assets** (FARTCOIN, PEPE).
- **Actionable Strategy:** This shows that *what* you trade is as important as *when*. Smart money accumulates quality, while unsuccessful traders are over-leveraged in speculative assets and are forced to sell them at a loss.

Strategy 3: Calculated Risk vs. FOMO



- **Insight:** Bottom traders take their biggest risks (highest average trade size) during "Greed," a classic sign of FOMO. Top traders also increase their size, but *critically*, they also deploy significant capital during "Fear."
- **Actionable Strategy:** This implies top traders have capital *reserved* for these "dip buying" opportunities. Their risk is pre-planned and calculated, not a reaction.

Conclusion

The data shows a clear and repeatable path to successful trading. This path is defined by a consistent, contrarian system:

1. **Act** when others are fearful (buy the dip).
2. **Focus** on high-quality assets (buy BTC/ETH, not just hype).
3. **Manage** risk with a consistent plan (don't go "all-in" with FOMO).

The average trader does the exact opposite, which creates the very opportunities the top performers use to stay profitable.

Note on Data: The leverage column mentioned in the assignment instructions was missing from the historical_data.csv file. To compensate, I used Size USD (total trade value in USD) as a proxy for risk-taking and capital deployment, which provided the insights for Strategy 3.