Report on

Analysis of Historical Trade Data for Binance Accounts

By

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1. Introduction

The objective of this analysis is to evaluate and rank various Binance accounts based on their trading performance over a period of 90 days. The analysis includes calculating multiple financial metrics for each account and ranking them based on performance. The key metrics include:

- Return on Investment (ROI)
- Profit and Loss (PnL)
- Sharpe Ratio
- Maximum Drawdown (MDD)
- Win Rate
- Win Positions
- Total Positions

2. Data Preprocessing

The dataset consists of historical trade data across various Binance accounts, with each trade containing details like timestamp, asset, side (BUY/SELL), price, and quantity. The data was loaded into a pandas DataFrame and the following preprocessing steps were performed:

- **Handling Missing Values**: Any missing or null values in critical columns such as Port_ID, realizedProfit, or side were identified and handled by either filling or removing rows as necessary.
- **Data Cleaning**: Duplicates were removed, and invalid rows were dropped to ensure the analysis was based on clean and accurate data.

3. Feature Engineering

To perform the analysis, the following key metrics were calculated for each account:

Return on Investment (ROI)

ROI measures the percentage return on the total investment. For each account, ROI was calculated using the following formula:

$$\text{ROI} = \frac{\text{Total Realized Profit}}{\text{Total Invested Amount}} \times 100$$

Profit and Loss (PnL)

PnL is the net profit or loss for each account over the 90-day period. This is the sum of realizedProfit for each account.

Sharpe Ratio

The Sharpe Ratio is a measure of risk-adjusted return. It was calculated as:

$$\text{Sharpe Ratio} = \frac{\text{Average Return}}{\text{Standard Deviation of Returns}}$$

Maximum Drawdown (MDD)

MDD is the largest drop from a peak to a trough in the account's cumulative profit over the period. It was calculated using the following steps:

1. Calculate the cumulative sum of realized profits.
2. Find the maximum drop from any point in the cumulative sum.

Win Rate

Win Rate is the percentage of trades that resulted in profit. It was calculated by counting the number of profitable trades and dividing by the total number of trades for each account.

Win Positions

Win Positions refer to the number of trades that were profitable. It was counted by considering only the realizedProfit > 0 trades.

Total Positions - Total Positions represent the total number of trades each account made.

4. Ranking Algorithm

After calculating the metrics for each account, a ranking system was developed. Each metric was assigned a weight based on its perceived importance. The final score for each account was calculated by summing the weighted metrics.

Weighted Scoring System:

- ROI: Weight = 0.3
- Sharpe Ratio: Weight = 0.3
- Win Rate: Weight = 0.2
- MDD (Inverse): Weight = 0.2

The formula for the final score is:

$$\text{Score} = (\text{ROI} \times 0.3) + (\text{Sharpe Ratio} \times 0.3) + (\text{Win Rate} \times 0.2) + (\text{Inverse MDD} \times 0.2)$$

The accounts were ranked based on the highest scores.

5. Results

The **Top 20 Accounts** are sorted based on the final score, with the highest rank reflecting the best-performing accounts in terms of ROI, Sharpe Ratio, and other metrics.

6. Conclusion

This analysis provides valuable insights into the trading performance of various Binance accounts over the last 90 days. By calculating key financial metrics and ranking accounts based on these metrics, we can identify the most successful accounts. The top 20 accounts show the highest ROI and lowest drawdowns, indicating strong performance.

Key Insights:

- Accounts with higher ROI also tend to have better Sharpe Ratios, suggesting that these accounts are earning more per unit of risk.
- The **MDD** metric reveals that accounts with high risk-adjusted returns (Sharpe Ratio) tend to have a smaller maximum drawdown.
- The **Win Rate** is a strong indicator of consistent performance, as accounts with a higher win rate show a better overall ranking