Group: *Trading, Start!*

Project Presentation

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Table of contents

01

Introduction

Introduction

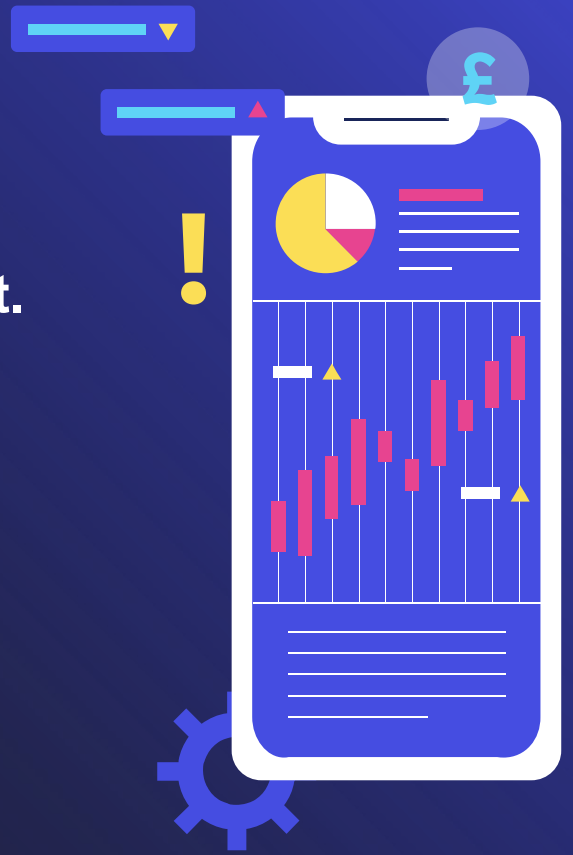
Two innovative trading strategies:

Strategy 1: Mechanics of a traditional grid system- refined for the volatility of the market.

A responsive grid - adjusts levels based on predefined margins.

Strategy 2: Construction of a two-asset portfolio.

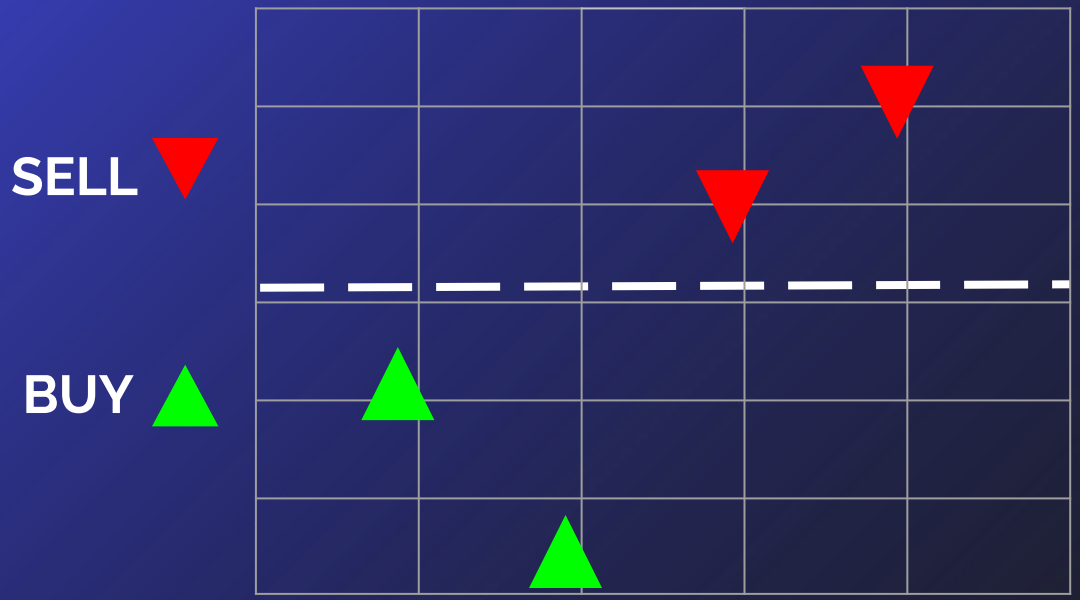
Weighted to achieve a high correlation with a third asset



02

Our Strategies

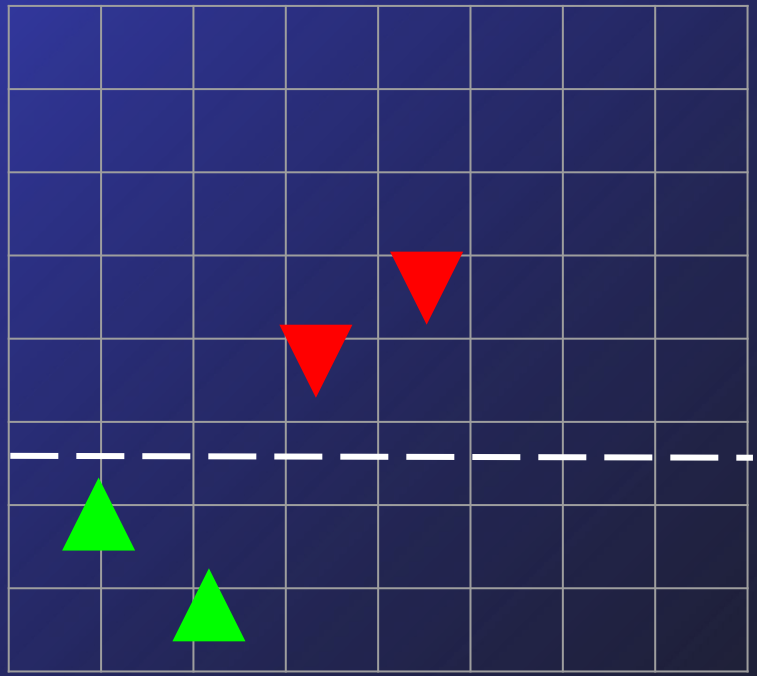
Our Strategies - Grid Trading

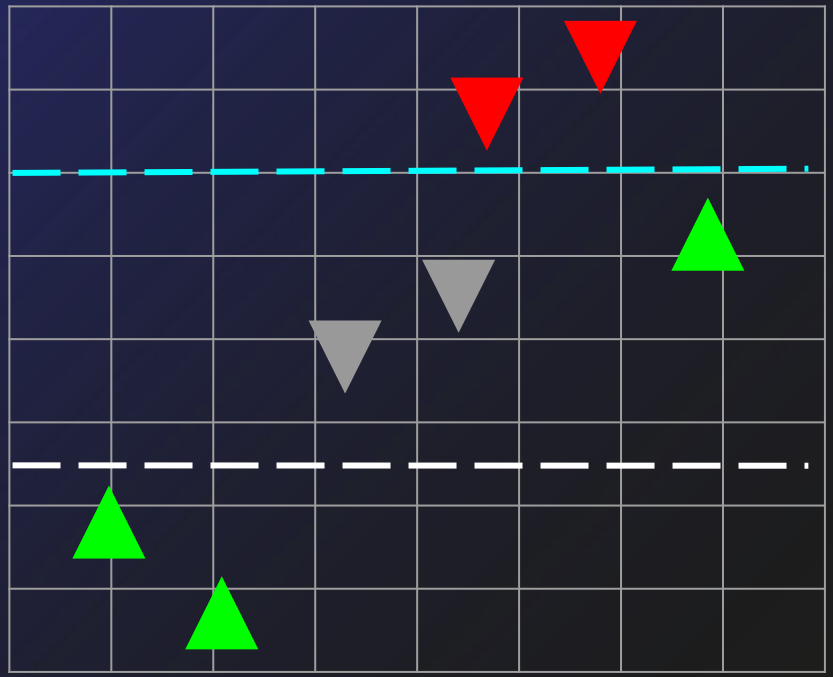


- Determine the initial price and grid parameters.
- Establish the grid price levels
- The system automatically executes the trades

Our Strategies - Grid Trading (Cont.)

Adjust the grid automatically





Our Strategies - Price Parity

Inspiration

- For perpetual contracts, exchanges use funding rate to ensure the futures contracts price aligned with the spot price.
- A very simple, common way of “arbitrage” (with controlled risks)
  - long futures short spot, or,
  - long spot short futures.

A Generalization

To generalize this example, we consider a forward contract on an investment asset with price S_0 that provides no income. Using our notation, T is the time to maturity, r is the risk-free rate, and F_0 is the forward price. The relationship between F_0 and S_0 is

$$F_0 = S_0 e^{rT} \quad \textbf{(5.1)}$$

Our Strategies - Price Parity (Cont.)

The strategy

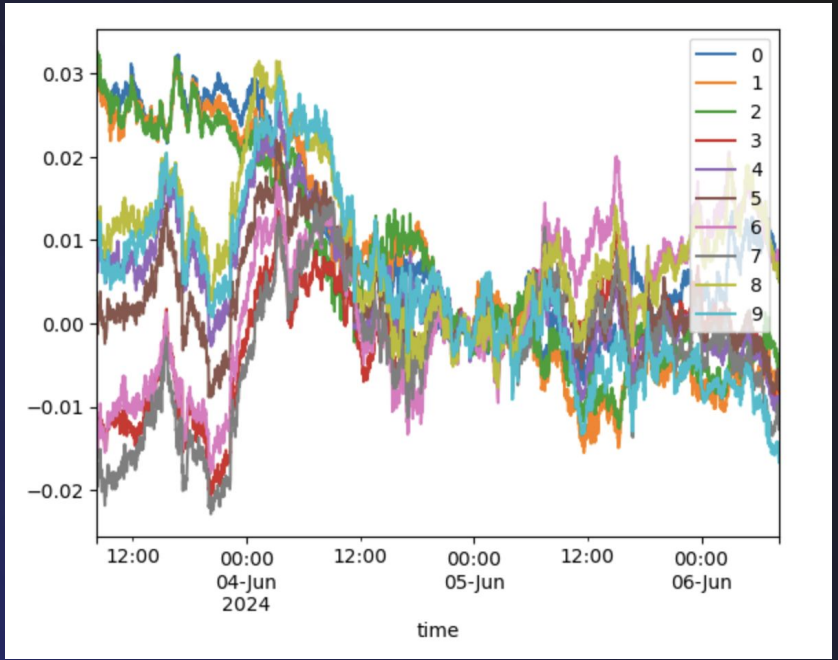
- Try different combinations, form a portfolio with two assets that generates a high correlation with the third asset.
- **Different direction, same amount** invested on the portfolio and the third asset.
- The correlation and the price difference between the portfolio and the third asset are assumed to be stable with in a short time period.
- With risks **being controlled**, earn money from the fluctuation of the difference in the prices, simply buy low and sell high.

$$
\begin{aligned}
Corr(P, A_3) &= Corr((\omega \cdot A_1 + (1-\omega) \cdot A_2),\ A_3) \\
&= \frac{\omega \cdot Cov(A_1, A3) + (1-\omega) \cdot Cov(A_2, A_3)}{\sqrt{\omega^2 \cdot Var(A_1) + (1-\omega)^2 \cdot Var(A_2) + 2 \cdot \omega \cdot (1-\omega) \cdot Cov(A_1, A_2)} \cdot \sqrt{Var(A_3))}}
\end{aligned}
$$

Our Strategies - Price Parity (Cont.)

The Parameters

- 1-min klines from T-3 to T-1 to calculate the correlations between different contracts, and the respective variance.
- Pick top 10 combinations, draw the price difference.
- Run for ONE day!
- Use the last 12 hours' mean price difference as the fair one.
- Buy under -0.003, sell above +0.003.
- Grid distance 0.0004.



Our Strategies - Price Parity (Cont.)

The Parameters (Cont.)

- **$200** each order, maximum 50 positions.
  - It's a game, but **not unreal**.
  - To ensure orders are filled with the first (several) price(s).
- Stop loss 0.025 (never reached except for one unexpected scenario)
- Stop profit ~~0.006, 0.004 + max(0, 20 - self.position_count) * 0.0003~~, 0.003 + max(0, 20 - self.position_count) * 0.0003
  - We wanted (yet failed) to earn BETTER than the exchange!

Picture from: https://www.cheddarflow.com/blog/unreal-engine-stock-your-smart-guide-to-investing-in-2024/

03

Performance and Results

Performance and Results

Overall performance

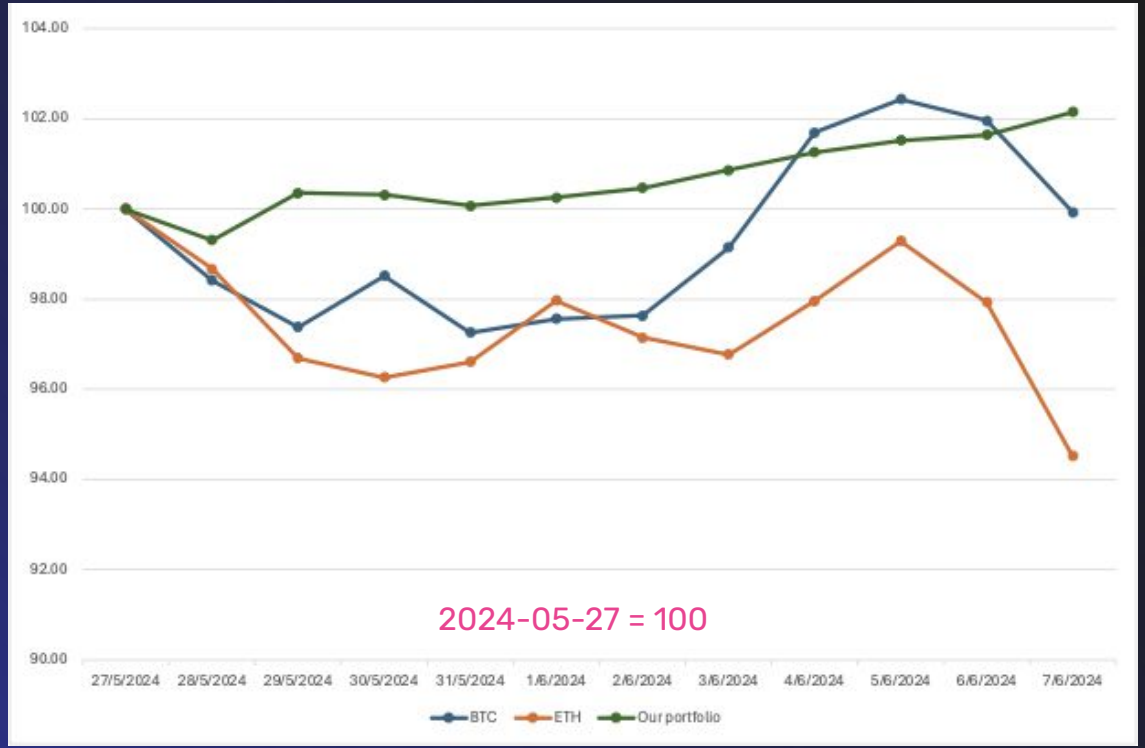
- **2.15%** return in 10 days!
- Max drawdown **ONLY -1.05%**.
- Slightly qualified as an adequate (we don't have the confidence to say good) performance with a **1.06 Sharpe ratio**.

Summary	
Profit & Loss	$215.36
Return	2.15%
Max Drawdown	-1.05%
Sharpe Ratio	1.06
Total Balance	$10,215.36

Performance and Results (Cont.)

The Comparison

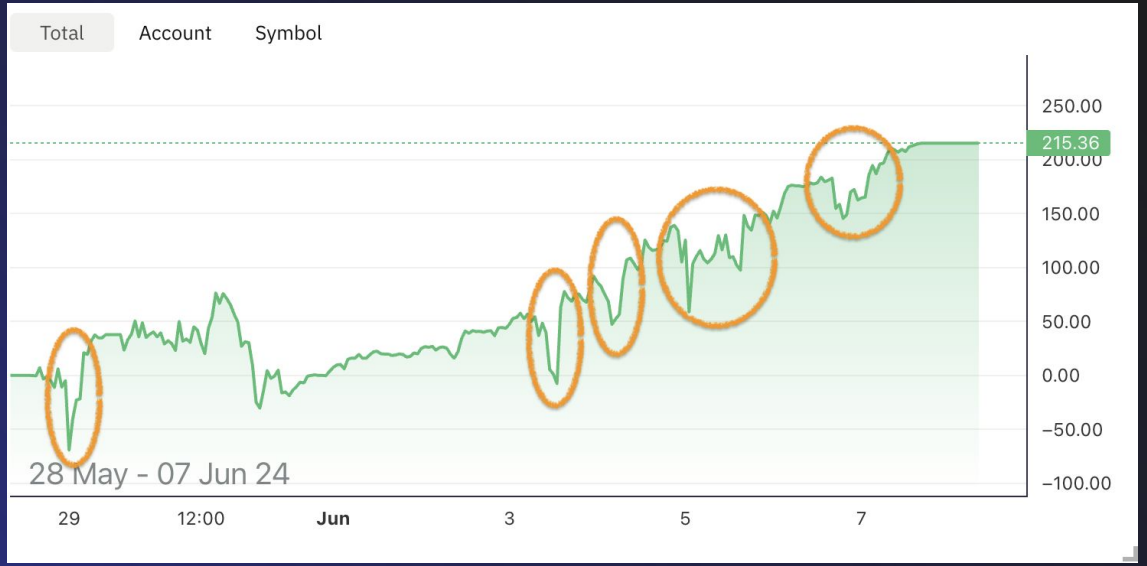
- **A stable growth** is maintained
- Despite of the market condition



Performance and Results (Cont.)

The Bounces

- Our assumption holds **TRUE**!
- **INVISIBLE FORCES** drag the price difference (**quickly?**) back to a fair level.



04

Pains and Gains

Lesson 1 - Start Tests Earlier

Picture screenshot from: https://www.youtube.com/watch?v=1PkhMgPC2ZM

Lesson 2 - Stick to the Plan

- On day 2 to day 3, we suffered the greatest drawdown.
- The portfolio was supposed to be changed, but we just left it for another day(, beyond our assumption).
- We could do much better if we sticked to the plan.

Picture screenshot from: https://music.youtube.com/watch?v=mpYgugV5lDo

05

Conclusion and Suggestions

Conclusion

The first strategy: adaptive grid mechanism.

The second strategy: correlation and calculated asset weighting.

The fruits:

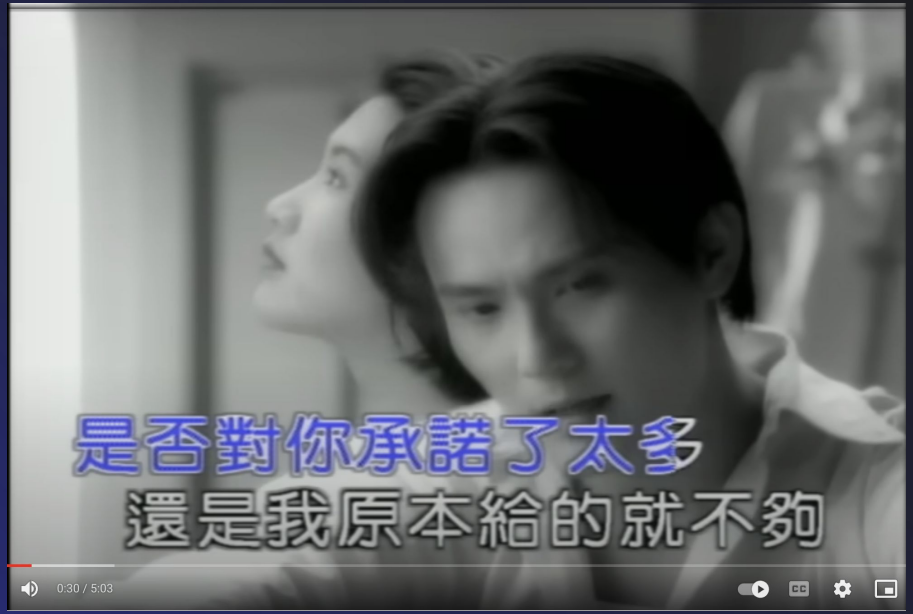
2.15% return over 10 days.
A maximum drawdown just above 1%.
The Sharpe ratio of 1.06.

Suggestions / Features Request

What we need during the competition?

1. An API (ideally inside the instance) to subscribe/unsubscribe market feeds
    a. We switched between different assets on a daily basis.
    b. We had to do that on the webpage (, which is easy to be forgotten).

2. Export trade records with more granularity
    a. We wanted to summarize trades within a specific timeframe.
    b. We had to (sadly) do manual filtering with the daily data (too ~~lazy~~ busy to improve).



Picture screenshot from: https://www.youtube.com/watch?v=SrD36rogSjc

Disclaimer

DO YOUR OWN RESEARCH

Picture screenshot from: https://www.bilibili.com/video/BV1HC4y1a7hp/

Thanks!

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