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Introduction to Fintech – Final Project

1. Problem Description

- 以 python 開發交易策略（參考文件：https://github.com/Crypto-Arsenal/public-docs），提交至 CSIE5434 比賽。
- 初始模擬資金為 100,000 USDT。
- Binance 交易所 BTC/USDT 實時模擬交易。

To put it simply: given an initial fund of 100,000 USDT (Tether), we have to increase the balance by the means of quantitative trading between BTC/USDT with the Binance trading platform.

2. Strategy and Analysis

I registered two strategies in the competition. Both of the strategies are based on the example code (MACross: Moving Average Crossover Strategy, *detailed analysis of this strategy can be found here: https://mt4trendindicator.com/using-moving-averages/*) with some modifications (*我自己寫的程式的結果比 example code 更糟, 因此只好用那 example code*). Initially, after extensive amount of backtesting, I concluded that it is impossible to get positive ROI value with the example code. In fact, more trades would result in higher loss (negative ROI value).

Illustration examples:

1. Backtesting result of the example code within the settings:
   self.period = 500, self.ma_long = 12, self.ma_short = 5.
   Testing period: 2020-06-15 00:00 ~ 2020-06-22 00:00 (one week)

2. Backtesting result of the example code within the settings:
   self.period = 5000, self.ma_long = 12, self.ma_short = 5.
   Testing period: 2020-06-15 00:00 ~ 2020-06-22 00:00 (one week)

3. Backtesting result of the example code within the settings:
   self.period = 10000, self.ma_long = 12, self.ma_short = 5.
   Testing period: 2020-06-15 00:00 ~ 2020-06-22 00:00 (one week)

*period is too big, so no trade occurred for this particular simulation.

From above results, I concluded that more trades (by setting lower period) would result in more loss. I believe this is caused by the substantial handling fee (手續費 0.1%). If the handling fee is set to be lower, 0.01% for example, there is a good chance that the sample code might yields a positive ROI value (obviously,

the length of the trading period and BTC-USDT trade chart at the time also played a part too).

Based on this finding, my first strategy was to make sure that my algorithm does not make any transaction at all by setting the period to be a large enough value. I believed that the majority of the competitors would not get a positive ROI value and just ensuring that I do not lost any asset would be enough for me to get a high rank in the competition. At the time this report is written (July 2-3, 2020), my prediction is correct and only two strategies yield positive ROI value, and one of them is my second strategy (which is problematic too).

Unfortunately, no transaction (ROI = N/A) automatically puts you in the last place, which in my opinion does not make any sense as in real life surely no trade at all is way better than making trades which result in loss of assets.

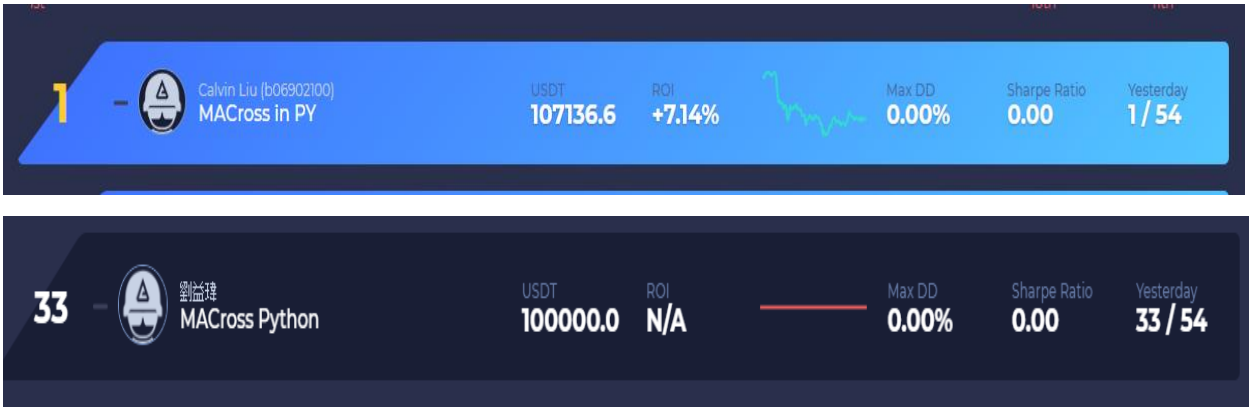
After I registered my first strategy, I thought of a surefire way strategy to yields a positive ROI value. At the time when I registered this strategy, I was unsure whether this strategy is allowed or not. The strategy is to change the order type from market order to limit order. A market order is an order to buy or sell a security immediately. This type of order guarantees that the order will be executed, but does not guarantee the execution price. On the other hand, a limit order is an order to buy or sell a security at a specific price or better, and it is not guaranteed to execute. A limit order guarantees that an order is filled at or better than a specific price level. In other words, with limit order, the worst case scenario would be a no trade, which is just like the first strategy. There is no risk at all of capital losses.

However, this strategy is too convenient and I am doubting its legality now. I might have miss the rule that states the order has to be a market type (I did not find any in the github repository: https://github.com/Crypto-Arsenal/public-docs).

Github repo for the strategies:
https://github.com/CalvinL15/Fintech-Final-Project/tree/master

3. Result and Final Comments

This is the current standing for both of my strategies as of Friday, July 3, 2020:



Comments

1. 首先, 我想道歉一下註冊了兩個策略
2. 考慮到比賽時間很短, 我認為手續費設了有點高, 讓很難得到 profit.
3. I think it would be beneficial for competitors to know beforehand that N/A ROI is treated as even worse than negative ROI. (I might have missed it in the final project's 說明 and/or in the 比賽規則).
4. Although the results might suggest otherwise, I have learned a lot about quantitative trading, stock price (especially BTC-USDT related), and also about investment terms (Sharpe Ratio, due-diligence, etc) from this project.
5. 我個人覺得那個網站 crypto-arsenal.io 很有趣, 而我 backtest 了 for many differing scenarios, and it gave me an understanding that achieving profit with quant trading is not an easy task.