An introduction to individual algorithmic trading project

Louis Wan

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1 Introduction

This project aims to build a fully automated trading system with SPtrader C++ API assisted with cloud-based automation system. Back-testing engine will also be implemented with the aid of python packages. Seeking for trading edges with statistical analysis and machine learning tools. This report will go through the data source, software design and data visualization tools of cloud-based automation system.

2 Data source

2.1 HKEX

Here are the data collected from HKEX

• HKEX Stock market Daily Quotations Data

• HSI Futures, Options Daily Market Report

• HSI Market Share data

• Warrant, Inline Warrant and Callable Bull Bear Contracts data

• Stock Connect Southbound CCASS data

2.2 CME

Here are the data collected from CME

• CME Futures, Options Settlement data

2.3 Yahoo! Finance

Here are the data collected from Yahoo! Finance

• Earnings and Stock Split calendar data

3 Trading Products

Since the limitation of capitial size. For better risk control, following products are the main focus.

• Mini Heng Seng Index Futures (MHI)

• Micro E-mini Nasdaq-100 Index (MNQ)

Initial margin is set at 50000 HKD cash equivalent for every contract above.

4 Software Design and technology

4.1 Cloud-based automation system

This automation system is built and deployed on digital ocean. It is updating and delivering analysis report on daily basis. The application can be divided into two parts, service layer and model layer.

Diagram

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**Figure 1: Architecture of automated financial data application**

Service layer involving download data, data transformation, report generation and report delivery with telegram API.

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**Figure 2: Script of HKEX warrant and CBBCs service**

Model Layer contains the database schema and act as an agent let services connect with database.

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**Figure 3: Script of HKEX warrant and CBBCs data model**

Database store all the financial data and telegram user group data

Graphical user interface

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**Figure 4: Screenshot of database schema**

5 Signals and Data visualization

For HKEX and CME data summary, data analysis report will generated before 9:00 am and 8:30 pm. Some of the screenshot is generated below

Graphical user interface, application

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**Figure 5: Screenshot of message generated by Telegram bot**

6 Performance

Here is the trade record of 2022 Nov for reference.

Table

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**Figure 6: trade record of 2022 Nov page 1**

Table

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**Figure 7: trade record of 2022 Nov page 2**

7 Planning

In 2023, following task is planned to be finished

• Back-testing and performance analysis tools (python, backtrader)

• live-trading application (C++, SPtrader API)

• Implement Swing trade strategy by study of co-integration between markets (VECM, machine learning tools)

Thanks for reading and it would be grateful if I am able to present my idea directly. Please feel free to reach me via Email(chwanlouis@gmail.com) or mobile (+852 63018527)