Sales Report Repository Tool

Part I - Introduction

This project is to implement a simple approach to import data in a simulated warrant market and generate reports for reference.

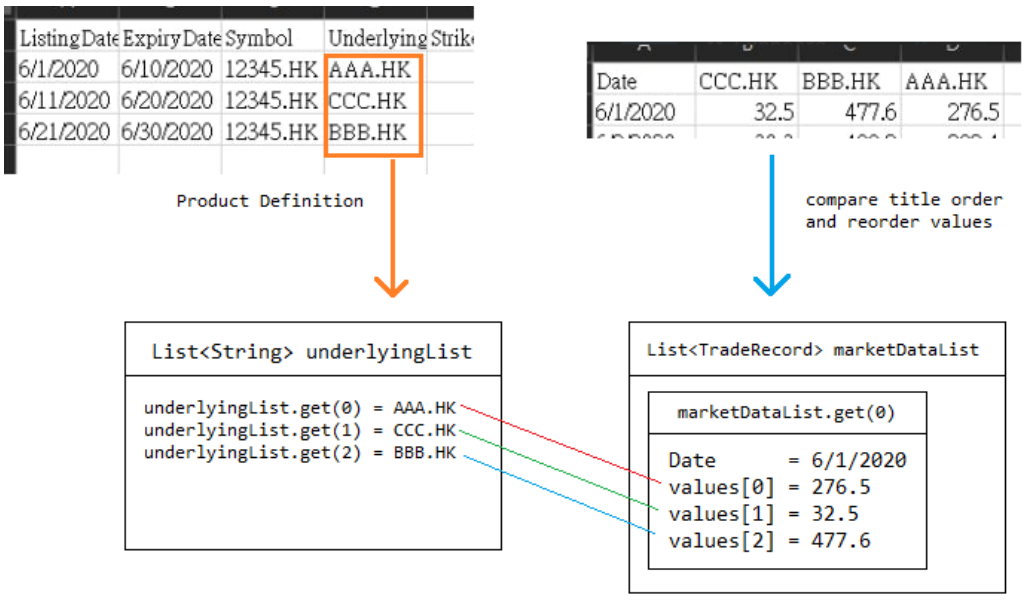
The program is developed in Java, with IntelliJ IDEA as IDE, using Java 1.8.

Part II - Data Structure Design

There are different types of data from the given dataset, they can be summarized as below:

- product definition
- stock and stock price (fields related “underlying” in program)
- warrant and warrant price (fields related to “symbol” in program)
- warrant inventory

When importing the data to memory, I have divided the titles and values into different lists. For example, there are two lists in MarketData, one is a string list for storing only the symbols of stocks, another one is a designed TradeRecord class, storing date and stock price of different stocks. These two lists can be linked by their index in the list, which is aligned when importing the data.



How this works in data import

Part III - Report Generation

After importing the data to memory, we can generate the report easily with the organized data structure.

Basically, a daily report can be generated by providing the date and warrant symbol. To satisfy the requirement, like calculate the sum of PnL in the month and finding moving average need multiple reports to be generated. So, in the program there are some loops for doing this task, looping between the selected days.

For the 3-Day Moving Average report, is nearly the same as normal report. In fact, we can identify a warrant by knowing the symbol, lifespan, and the stock it is underlying on. But we can locate it only with a date and a warrant symbol, then we can find out the values of the past two days to calculate the MA of the warrant.

Part IV - Discussions

As this is a coding challenge, some information and data are limited, which will need to make some assumptions for easier implementation, yet to keep possibilities for expanding the program in future. Here are some ideas which I think are deserved to mention about.

In this program, all product data should have been defined in Product Definition file, otherwise, they will be treated as invalid data, because we cannot find the relationship between stocks, warrants and dates without this production definition datasheet.

In the real market, not every warrant will be listed and ended in the same month. Therefore, when generating the 3-days moving average report, I chose to print from “Day 1” of the warrant’s lifespan, instead of the “Day 1” of the month to express more clearly.

There may also be some data verification and validation can be done better for real-life production environment usage, like using the program for daily automated tasks, to validate user’s file and send notification emails and so on. However, they will not affect the major function of the program, and those features can be improved in future.

Part V - Quick Start Guide

Before starting the program, please place the SalesAnalytics folder containing the 4 .csv files into the directory of the program.

In the attachment, the .jar file is already placed in Interview_executable folder with dataset. You can use Windows command line prompt to access to the folder and run the program with “java -jar Interview.jar”.

```
C:\Users\mat_m\Documents\_projects\_temp\SocGen\Interview_executable>java -jar Interview.jar
Import Production Definition data successful
Import Market Data successful
Import Daily Inventory Data successful
Import Daily PnL Data successful

Welcome to Sales Report Repository Tool
1. Print Imported Data
2. Show Monthly PnL Report
3. Show 3-Day Moving Average Report
4. Show Daily Report
5. Print Demo Data
6. Exit
Please input your choice: 5

Monthly PnL Report of 2020-6
| Issuer | PnL ($)  |
| ------ |:--------:|
| BankA  | -2117.30     |
| BankB  | -793.40      |
| BankC  | -526.30      |
```

When starting to run the program, you can see import success and a menu, if not, please check again the path of the files.

After entering the menu, you may just enter the corresponding number for the tasks.
Note: Task 5 can directly print out the demo data mentioned in Readme.md

```
Import Production Definition data successful
Import Market Data successful
Import Daily Inventory Data successful
Import Daily PnL Data successful

Welcome to Sales Report Repository Tool
1. Print Imported Data
2. Show Monthly PnL Report
3. Show 3-Day Moving Average Report
4. Show Daily Report
5. Print Demo Data
6. Exit
Please input your choice:
```

Part VI – Demo Result

```
Please input your choice: 5

Monthly PnL Report of 2020-6
| Issuer | PnL ($)  |
| ------ |:--------:|
| BankA  | -2117.30 |
| BankB  | -793.40  |
| BankC  | -526.30  |

3 days Moving Average of 12345.HK issued by BankA from 2020-6-1 to 2020-6-10
| Date       | Day   | PnL       | MovingAvgPnL |
| ---------- |:-----:|:---------:|:------------:|
| 2020-6-1   | 1     | -341.70   | -341.70      |
| 2020-6-2   | 2     | -198.20   | -269.95      |
| 2020-6-3   | 3     | 38.60     | -167.10      |
| 2020-6-4   | 4     | -242.20   | -133.93      |
| 2020-6-5   | 5     | 51.40     | -50.73       |
| 2020-6-6   | 6     | 115.90    | -24.97       |
| 2020-6-7   | 7     | -432.60   | -88.43       |
| 2020-6-8   | 8     | -289.10   | -201.93      |
| 2020-6-9   | 9     | -454.50   | -392.07      |
| 2020-6-10  | 10    | -364.90   | -369.50      |
```

Output of Task 5 – Demo