COMP4913

Capstone Project

Simulation Game for Learning Algorithmic Trading

Programme-Stream Code:	61431-SYC
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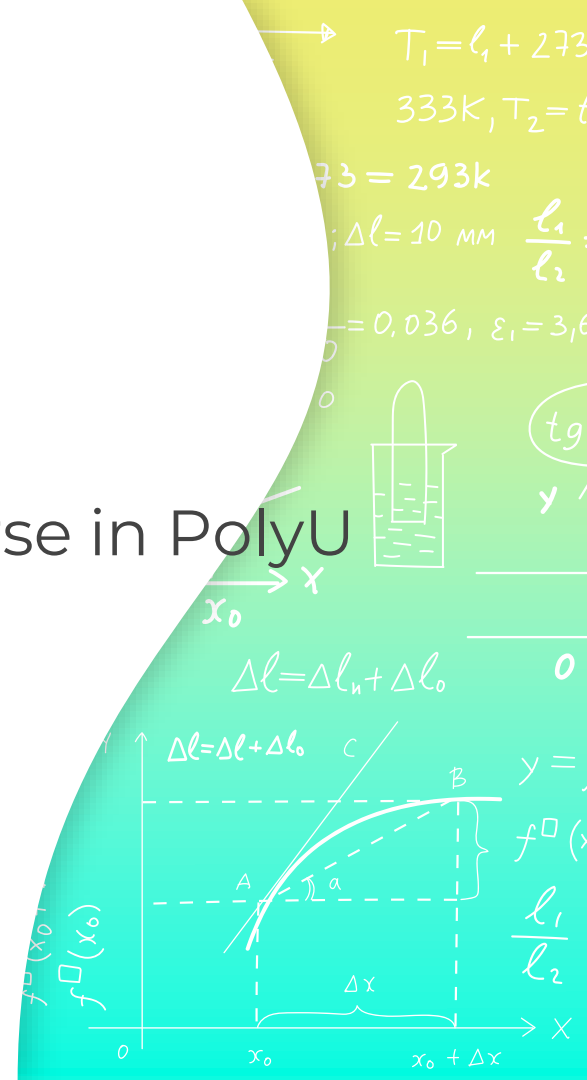


Project Overview

Algorithm trading

- Complex field
- Trading knowledge
- Programming skill to execute
- Challenging for beginner

Proposed solution

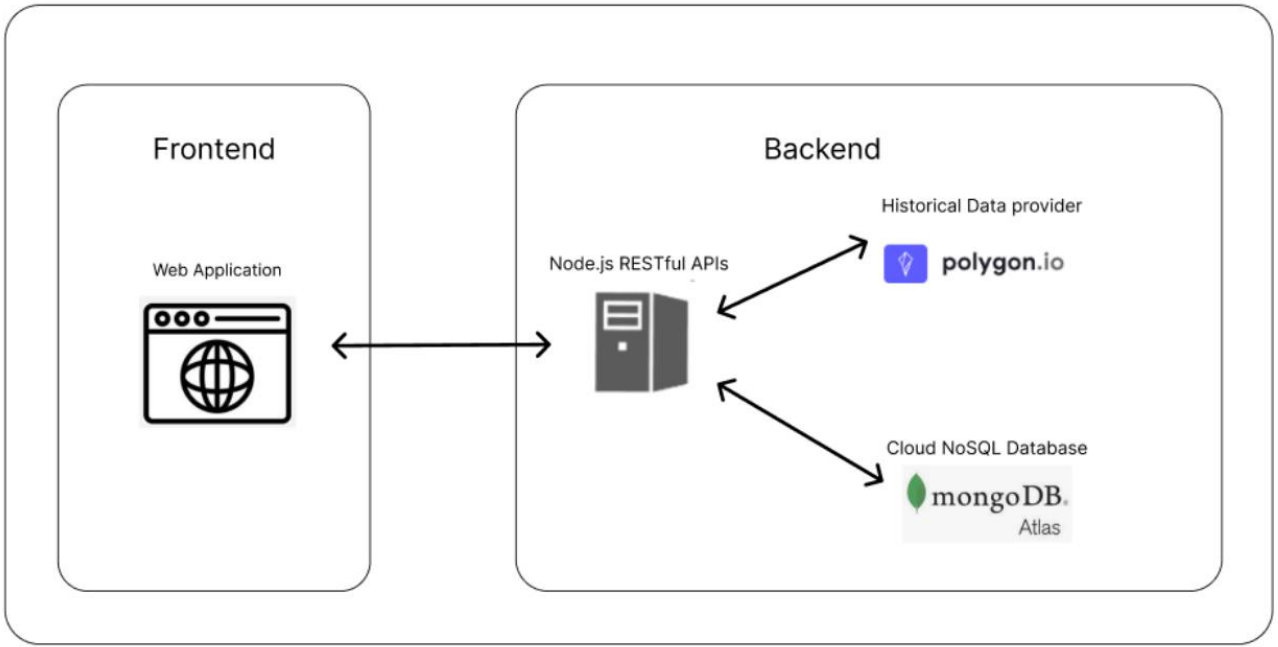
- Web-base software
  - Provide user interface for user to interact with.
- Purpose:
  - Allow users to learn about algorithm trading through the game play in a risk-free environment.
- Target:
  - Beginner

Development Details

- Web-based software
  - Frontend (React)
  - Backend (RESTful APIs server usingNode.js)
- Data
  - Using past market data
  - Polygon.io (getting updated data in daily)
- Database
  - Store user data (e.g., rules set)
  - MongoDB

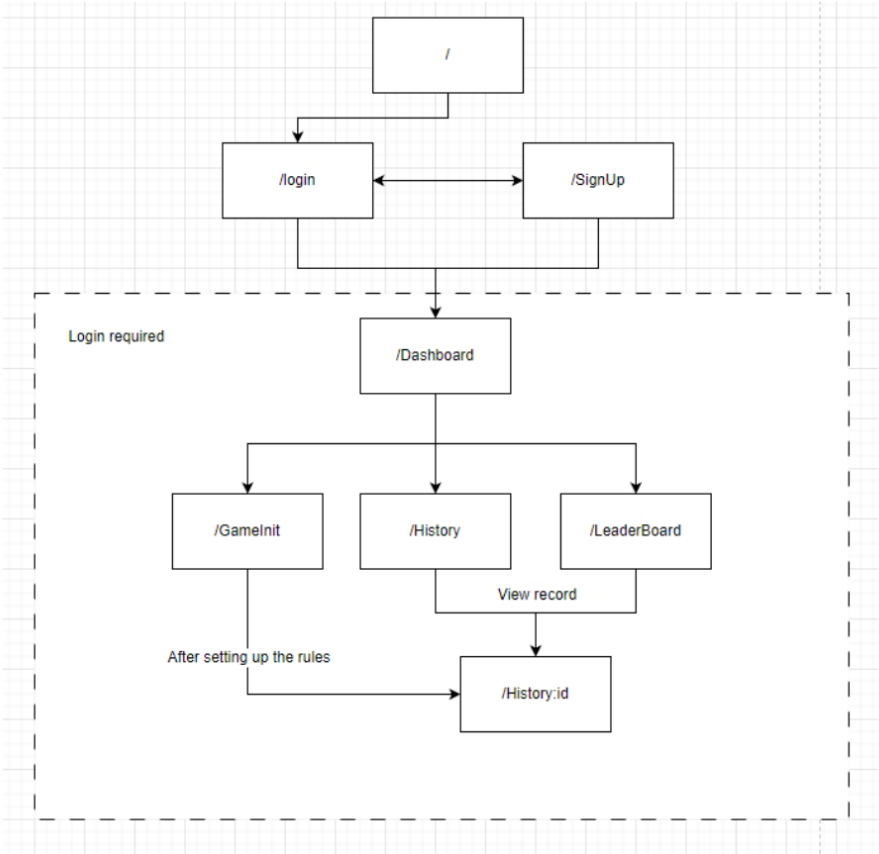
Development Details

- System architecture



Development Details

- Navigation map of the website
- The system require login
- After login (three main functions)
  - New game
  - History
  - Leader board



Game Level

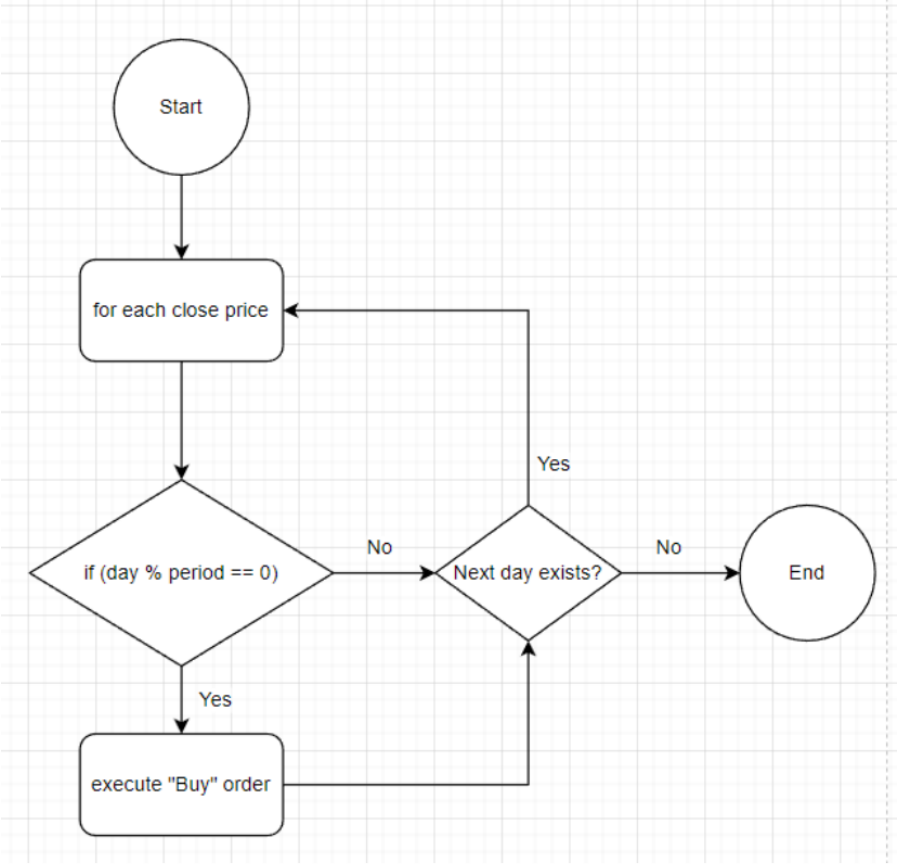
- Three game level
  - Dollar Cost Averaging (DCA)
  - Martingale
  - Custom rules set

DCA

- Good strategy for beginners who are just starting to invest
- it is simple to understand

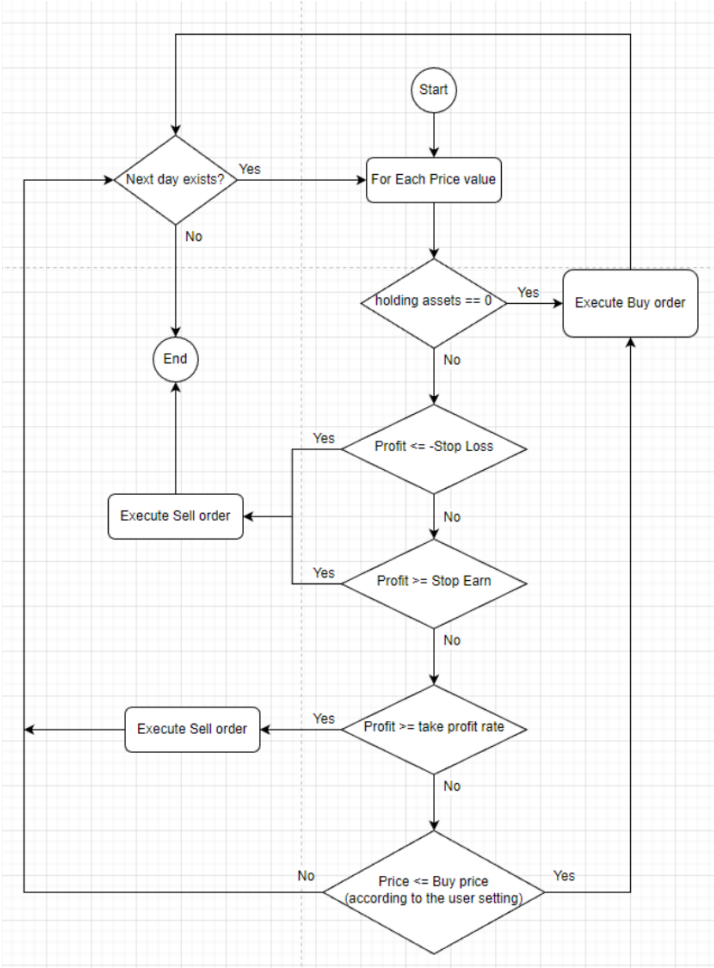
- Parameters
  - Invest period
  - Invest amount

- let them feel what it is



Martingale

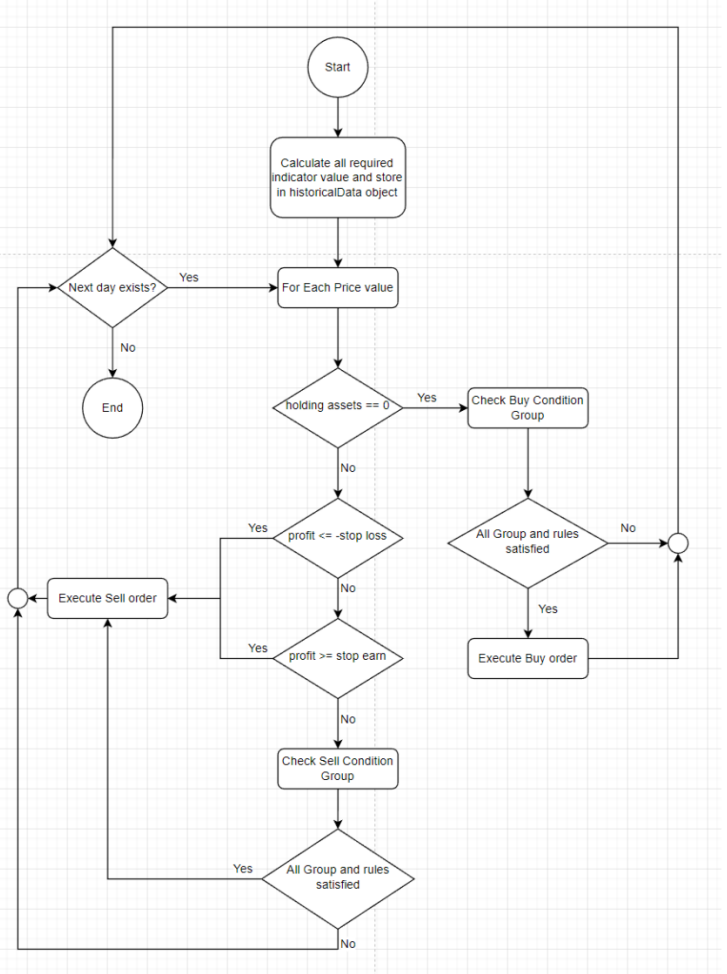
- Betting strategy
- Logic:
  - When Lose
  - Increasing the amount of the next bet. E.g., double the investment
  - Then once win, it will recover all loss with some profit
- High risk algorithm
  - Implementing some risk management concept here such as stop loss
  - to let user to learn this concept



Flow of Martingale Strategy

Custom Rules

- Rule-setting options
- current and previous
  - open,
  - high,
  - low,
  - close prices
  - and volume
- Some technical indicators
  - SMA: Simple Moving Average
  - EMA: Exponential Moving Average
  - ADX: Average Directional Index
  - RSI
  - MACD
  - Stochastic Oscillator



Flow chart of Custom Rules

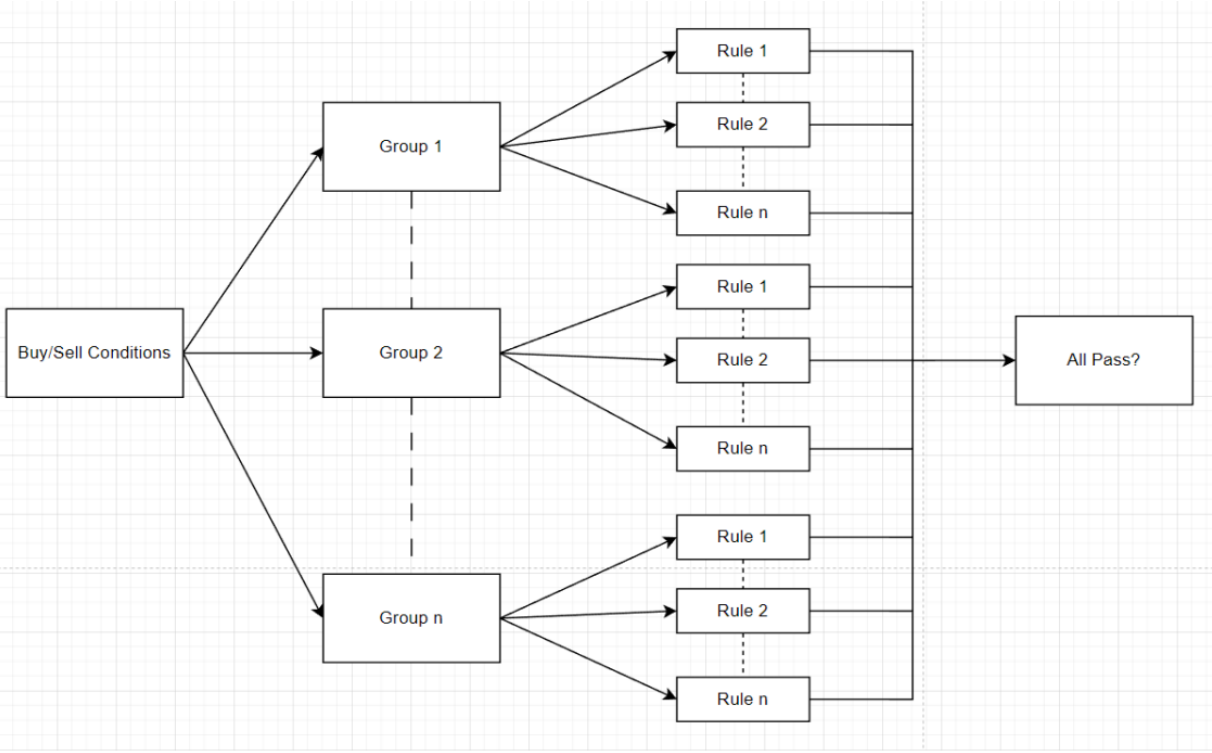
Custom Rules

- User need to setup Buy and Sell Conditions
  - Each condition form with different groups
  - Each group contains different rules

  - Three group operation
    - And: all rules should pass
    - Not: all rules should not pass
    - Count: only number of rules need to pass

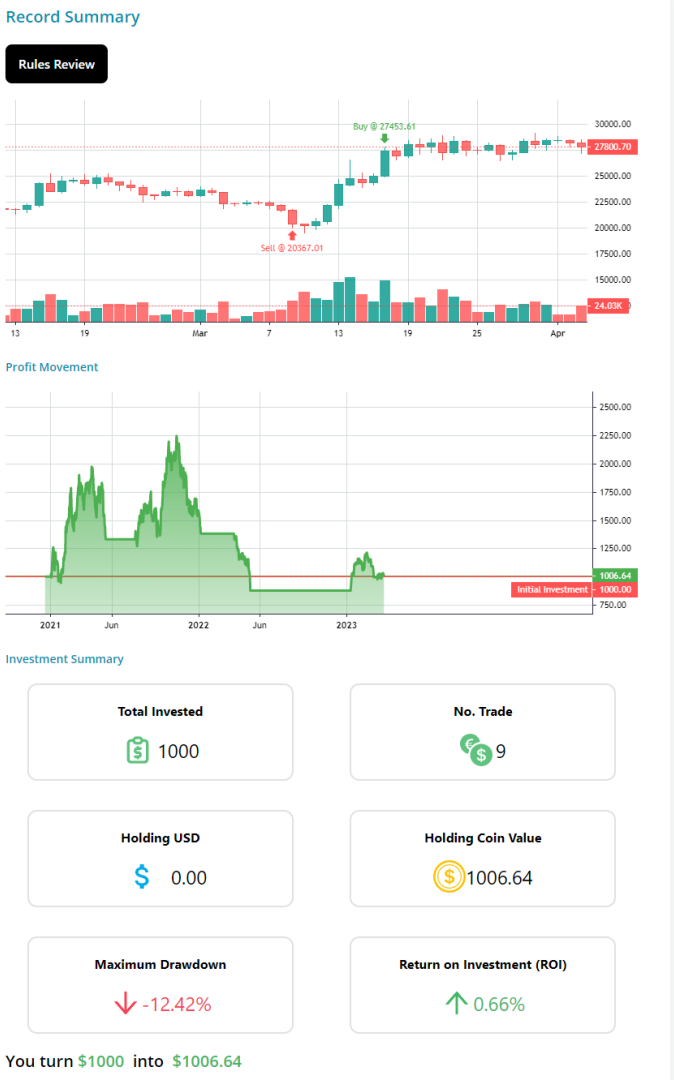
Custom Rules

- structure of the condition



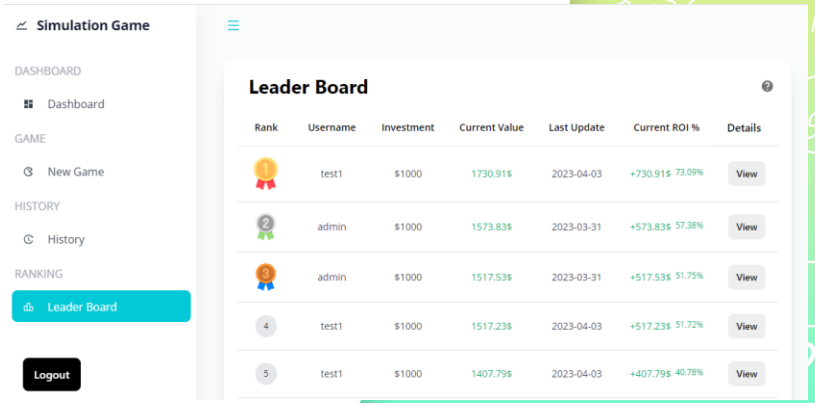
Record

- After setting up the algorithm
- Website will send the request to the server and ask for simulation.
- The response data will show in here.
- Generate buy/sell marker in the candle stick chart
- Profit movement chart
- Investment Summary
- etc



Leader Board

- Allow the users to look at other people’s performance
- Ranking according to the ROI (Return on Investment)
- Only the Custom Rules will count
- Updated daily
    - simulation the real time market



Integration with Course in PolyU

- This game can be utilized in various courses at PolyU
- Finance, technology, Fintech course
- Such as COMP4141, COMP4531
- Help them to gain hands-on experience in related topic

6.	**Beyond Crowdfunding: Crowdsourcing and Monetisation of Crowdsourcing**
7.	**E-Trading: Technology, Systems and Algorithmic Trading**

Syllabus of COMP4141

1. Current state of the major thematic areas in the FinTech ecosystem such as infrastructure (e.g., identity, privacy, security), crowdfunding (e.g., types, platforms, applications), e-trading (e.g., algorithmic trading), and peer-to-peer (P2P) lending.

Syllabus of COMP4531

Demo

Q&A


$T_1 = t_1 + 273$
333K, $T_2 = t$
$73 = 293k$
$\Delta l = 10$ мм
$= 0,036$, $\varepsilon_1 = 3,6$
tg
y
X
x_0
$\Delta l = \Delta l_n + \Delta l_0$
$\Delta l = \Delta l + \Delta l_0$
C
B
A
a
Δx
$f'(x_0)$
0
x_0
$x_0 + \Delta x$
X
$y =$
$f'(x$
$\frac{l_1}{l_2}$