



Design and implementation of stock forecasting system with AI

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Outline

Demo

System Architecture

Key Functionality

Technical Details

Contribution

Demo





System Architecture

System Architecture - Distributed Design



Frontend Architecture

Page Components

- Login/Registration Dashboard
- User Information Management Dashboard
- Stock Trading Dashboard
- Investment Analysis Dashboard
- AI Investment Advisory Dashboard

Backend Architecture

Server Configuration

- Express Server Setup
- Route Management
- Middleware Configuration

API Design

- RESTful Interfaces
- Data Validation
- Error Handling



System Architecture - Database Description

User table

| Column name | Type | Description |
|-------------|-----------------------------|---------------------------------|
| email | VARCHAR(255) | PRIMARY KEY, Store users' email |
| password | VARCHAR(255) NOT NULL | Store user password |
| balance | DECIMAL(10, 2) DEFAULT 0.00 | Store user balance in profile |



System Architecture - Database Description

Stock transaction table

| Column name | Type | Description |
|---------------|---|--|
| timestamp | TIMESTAMP DEFAULT CURRENT_TIMESTAMP PRIMARY KEY, | To store the timestamp of every transactions. Avoid primary key conflict |
| email | VARCHAR(255) NOT NULL, | Store the user's email of the transaction |
| stock_name | VARCHAR(255) | |
| number | INT | Store the number of stock user bought in this transaction |
| current_price | DECIMAL(10, 2) NOT NULL, | |
| is_sold | BOOLEAN DEFAULT FALSE | It will change to 0 if the user sold all of the stock |



System Architecture - Function API interface

| Function | API | Http method |
|-----------------------|----------------------|-------------|
| User login | /api/login | post |
| User register | /api/register | post |
| Change password | /api/change-password | put |
| Deposit money | /api/deposit | post |
| Sell specific stock | /api/sell-stock | post |
| See stock in purchase | /api/active-stocks | get |
| Give advice | /ge | get |
| Get stock trend | /api/stock-trend | get |

System Architecture - Function API interface



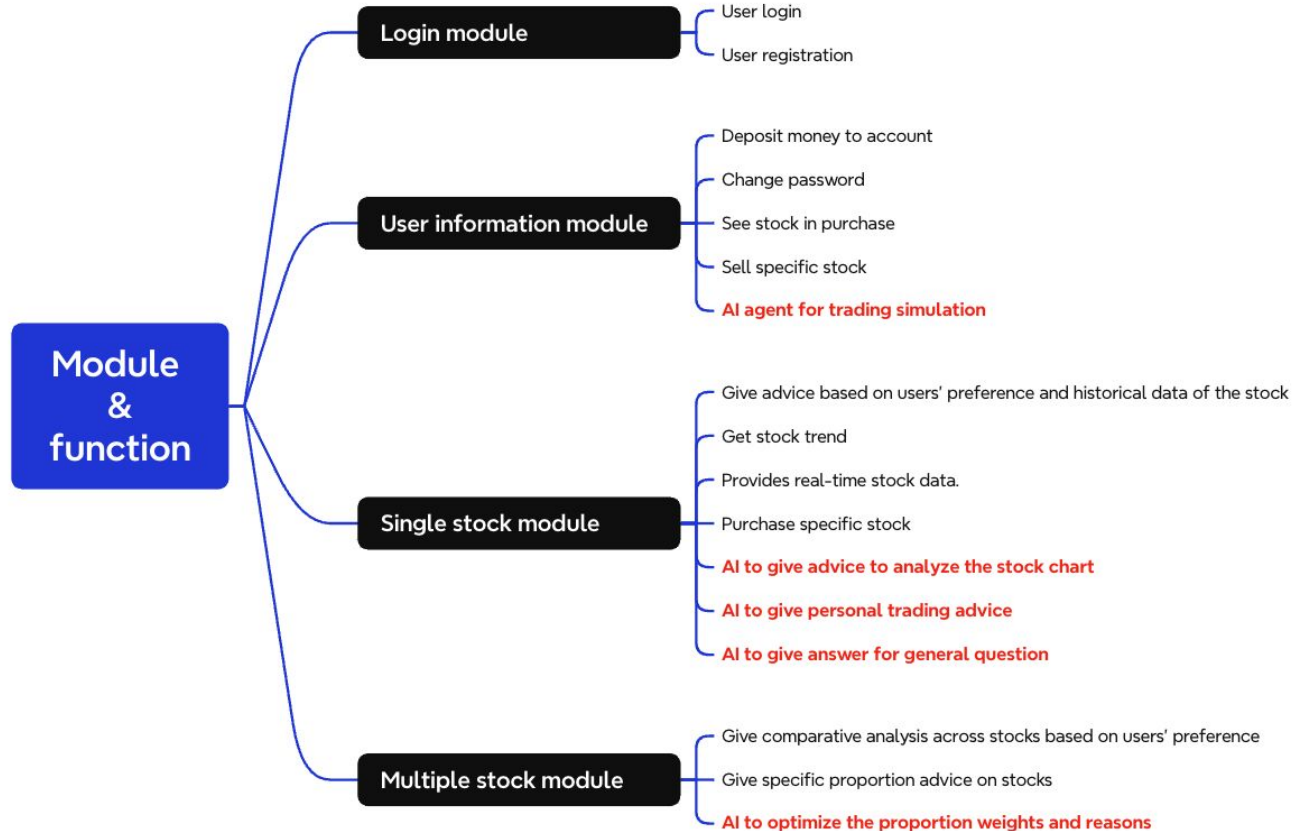
| Function | API | Http method |
|--|-------------------------------|-------------|
| Give comparative analysis across stocks based on users' preference | /api/portfolio-recommendation | get |
| Give specific proportion advice on stocks | /api/multiplestock-analysis | get |
| AI provide personal advice | /api/ai-personal-advice | post |
| AI optimize portfolio weight | /api/ai-predict | post |
| AI stock Q&A | /api/stock-qa | post |
| AI chart analyze | /api/analyze-chart | post |



Key Functionality

- Single stock prediction
- Multiple stock prediction
- User Information
- AI agent for stock forecasting

Key functionality - Module overview





Key Functionality - Login logistics

Register: first time into the stock analysis system

Username: user defines

Password: user defines

Login: after registration, register information are stored in the database

Username: user input

Password: user input

Error handling:

If user inputs a wrong password or nonexistent username. It will give alert

The image displays two overlapping form cards. The background card is titled 'Welcome' and 'Sign in to your account'. It features input fields for 'Username' and 'Password', a blue 'Sign In' button, and a link 'Don't have an account? Register here'. The foreground card is titled 'Create Account' and 'Join our stock portfolio analysis platform'. It features input fields for 'Username', 'Password', and 'Confirm Password', a blue 'Create Account' button, and a link 'Already have an account? Sign in here'.

Welcome

Sign in to your account

Username

Password

[Sign In](#)

Don't have an account? [Register here](#)

Create Account

Join our stock portfolio analysis platform

Username

Password

Confirm Password

[Create Account](#)

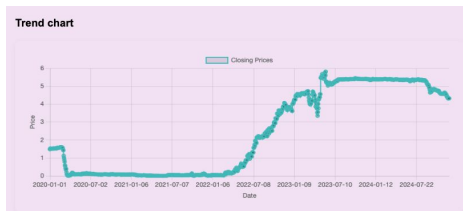
Already have an account? [Sign in here](#)

Single Stock Module - Single Stock Analysis

User input:

- **Stock ticker:** User chooses the ticker symbol
- **Initial capital:** User inputs the amount and it can get suggestions about the stock ticker
- **Real price:** User can view the real-time-price of the stock ticker

Trend chart: User can view the historical price of the stock ticker and can click on specific date to check the closing price



Basic Investment Rules

Investment Strategy: Buy the stock.

Suggested Trading Frequency: Quarterly

Real Price: \$6.5

Stop Loss Price: \$6.444857142857143

Position Size: 0 shares

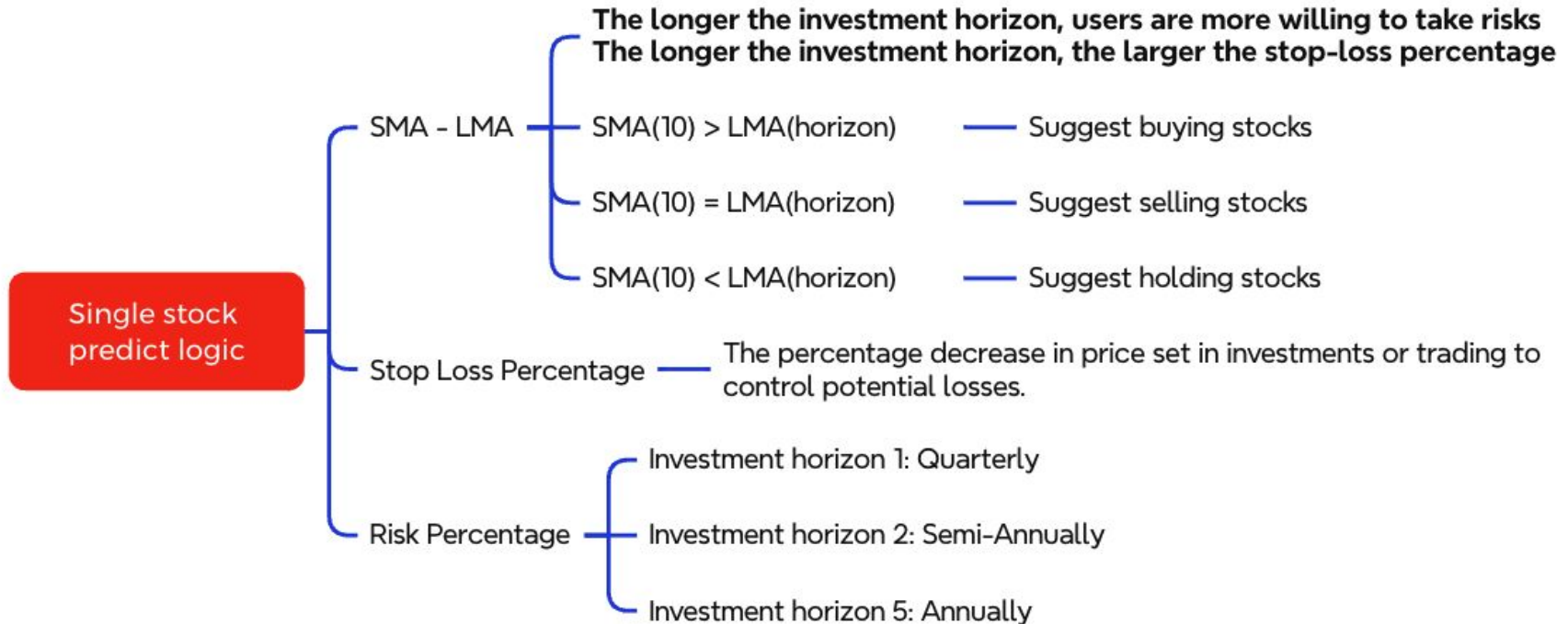
Risk Analysis

| | |
|-------------------------------|-----------------------------|
| Volatility: 10.45% | ATR: 0.03 |
| Max Drawdown: 100.00% | Value at Risk (95%): 14.29% |
| Conditional VaR (95%): 28.27% | |

Risk Components

| |
|------------------------------|
| Volatility Component: 0.10 |
| Beta Component: 1.00 |
| Max Drawdown Component: 1.00 |

Single Stock Module - Single Stock Prediction Logic





Single Stock Module - Single Stock AI analyze

Analysis Metrics

- Analysis metrics
- Strategy
- Frequency
- currentPrice
- maxDrawdown
- Var
- Cvar
- atr
- riskMetrics
- Volatility

Analysis Content

- Overall Market Analysis
- Risk Assessment
- Technical Analysis
- Investment Strategy
- Final Recommendation

AI analysis

AI Chart Analysis

Technical Analysis of HUOHUF1W Stock

1. Overall Trend Analysis

- **Long-Term Trend (2020 - Present):**
- The stock exhibited extreme volatility, starting at ~1.486 in January 2020, collapsing to near zero (0.005 in March 2020), then surging to an all-time high of **5.81** in May 2023.
- **Recent Trend (2024):** The stock has consolidated between **5.34–5.40**, showing a sideways pattern after peaking in early 2024.

- **Key Observations:**

- **2020–2021:** Catastrophic decline followed by erratic recovery.
- **2022–2023:** Strong bullish momentum, peaking at **5.81**.
- **2024:** Range-bound with resistance at **5.40** and support at **5.34**.

2. Key Support and Resistance Levels

- **Resistance Levels:**
 - **Immediate:** **5.40** (tested multiple times in 2024).
 - **Major:** **5.81** (all-time high, May 2023).
- **Support Levels:**
 - **Immediate:** **5.34–5.35** (2024 lows).
 - **Strong:** **5.00** (psychological and historical support).
- **Breakout Levels:

Single Stock Module - AI for general questions

1. Check API Key
2. Initialize OpenAI with DeepSeek API
3. Define /chat API Endpoint
4. Receive User Message
5. Send Message to DeepSeek API
6. Extract AI Response
7. Print AI Response with Typing Effect
8. Send AI Response to Client
9. Handle Errors Gracefully

Give some advice to a beginner stock buyer

Ask

****Advice for Beginner Stock Buyers****

Investing in stocks can be rewarding, but it requires knowledge, discipline, and risk management. Here's a structured approach for beginners:

****1. Start with Education****

- ****Learn the Basics****: Understand key terms like P/E ratio, market capitalization, dividends, and volatility. Resources like Investopedia or books like *"The Intelligent Investor"* by Benjamin Graham are helpful.
- ****Follow Reputable Sources****: Stay updated with financial news (e.g., Bloomberg, CNBC) and company earnings reports.

****2. Define Your Goals & Strategy****

- ****Long-Term vs. Short-Term****: Decide if you're investing for growth (long-term) or trading for quick gains (short-term). Long-term investing (e.g., index funds) is generally safer for beginners.
- ****Diversify****: Don't put all your money into one stock or sector. Spread investments across industries (e.g., tech, healthcare, consumer goods).

****3. Practical Steps to Begin****

- ****Open a Brokerage Account****: Choose a low-fee platform (e.g., Fidelity, Charles Schwab, or Robinhood for beginners).
- ****Start Small****: Begin with a small amount you can afford to lose. Consider ETFs (e.g., S&P 500 ETFs like SPY) for broad market exposure.
- ****Avoid Emotional Decisions****: Don't chase "hot tips" or panic-sell during market dips. Stick to your plan.

****4. Risk Control****

- ****Set Stop-Loss Orders****: Automatically sell a stock if it drops below a certain price to limit losses.
- ****Allocate Wisely****: Never invest more than 10–15% of your portfolio in a single stock.
- ****Emergency Fund First****: Ensure you have 3–6 months of living expenses saved before investing.

****5. Common Pitfalls to Avoid****

- ****Overtrading****: Frequent buying/selling increases fees and taxes.
- ****Inflation Fees****: High commission fees can erode returns.

Single Stock Module - Pseudocode for AI questions

1. Data preprocessing

Function prepareAnalysisData(stockData, stockTicker, basicAdvice, riskMetrics, riskComponents):

Create a request body object

```
analysisRequest = {  
  stockInfo: {  
    ticker: stockTicker,  
    currentPrice: basicAdvice.currentPrice,  
    strategy: basicAdvice.strategy,  
    frequency: basicAdvice.frequency,  
    quantity: basicAdvice.quantity  
  },  
  riskMetrics: {  
    volatility: riskMetrics.volatility,  
    maxDrawdown: riskMetrics.maxDrawdown,  
    riskScore: riskMetrics.riskScore  
  },  
  riskComponents: {  
    var: riskComponents.var,  
    cvar: riskComponents.cvar,  
    atr: riskComponents.atr  
  },  
  stockData: stockData  
}  
Return analysisRequest
```

2. AI Prompt creation

Function buildPrompt():

```
prompt = {  
  role: "system",  
  content: ""  
  Where question is put  
  ""  
}  
Return prompt
```

Single Stock Module - Pseudocode for AI questions

1. AI analyze

Function analyzeStockData(analysisRequest, prompt):

OpenAI API configuration

```
response = OpenAI.chat.completions.create({  
  model: "deeseek-4-turbo-preview",  
  messages: [  
    prompt,  
    {role: "user", content: analysisRequest}  
  ],  
  temperature: 0.7  
})  
Return response
```

2. Process the results

Function processAnalysisResult(response):

If response.success:

// Extract AI content

analysis = response.choices[0].message.content

// **Return a success results**

```
Return {  
  success: true,  
  analysis: analysis  
}
```

Else:

// **Return errors**

```
Return {  
  success: false,  
  error: "Analysis failed"  
}
```



Single Stock Module - Single Stock purchase

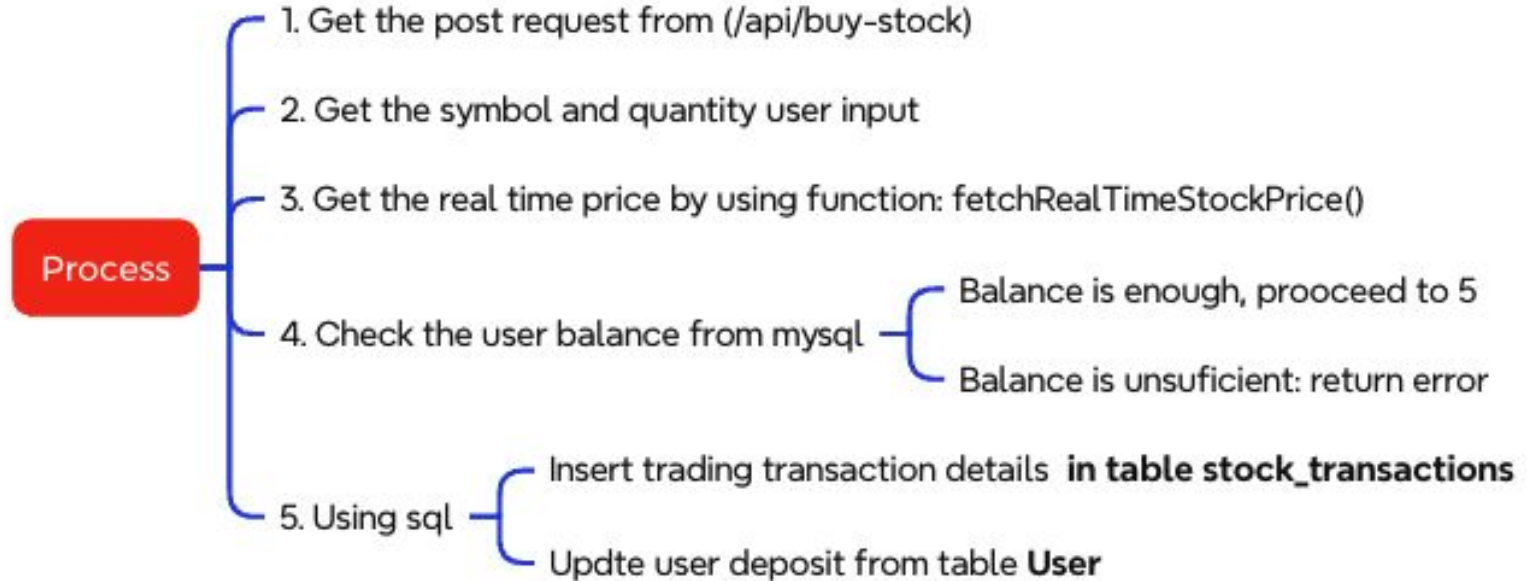
Input

- Stock Symbol: user input
- Quantity: user input

If user purchases successfully, it will give information: stock purchase successful

The screenshot shows a web interface for stock purchase. At the top, there are three tabs: "Single Stock Analysis", "Single Stock Purchase" (which is active and highlighted in green), and "AI Q&A". Below the tabs, a white box displays "Available Balance:" followed by the value "\$3537.15" in blue. The main section is titled "Stock Purchase" and contains a light purple box with the following elements: a "Select Stock:" label above a dropdown menu showing "huohuf6m", a "Quantity:" label above a text input field containing "4", and a green "Buy Stock" button. At the bottom left of the interface, a green message states "Stock purchase successful".

Single Stock Module - Single Stock purchase workflow **R**





Multiple stock module



Multiple stock module - Multiple stock prediction

Input:

Investment horizon,
The multiple of stocks
you want to input,

Output:

Recommend portfolios,
Portfolio weights,
AI optimized
weights(traditional and
AI method)

Multiple Stock Portfolio Analysis

Select Stocks

☐ huohuf1w ☐ huohuf1y ☐ huohuf2m ☐ r

☐ huohuf3m ☐ huohuf6m ☐ huohuf9m ☐ l

☐ plbpln1m ☐ plbpln3m ☐ plbpln6m ☐

☐ plopln1m ☐ plopln1w ☐ plopln1y ☐

☐ plopln3m ☐ plopln6m ☐ plopln9m ☐

☐ plopln12m ☐

Multiple Stock Analysis Suggestion

Investment Horizon:

1 year

Number of stocks to invest in:

4

Get Stock Recommendations

Analyze Portfolio Weights

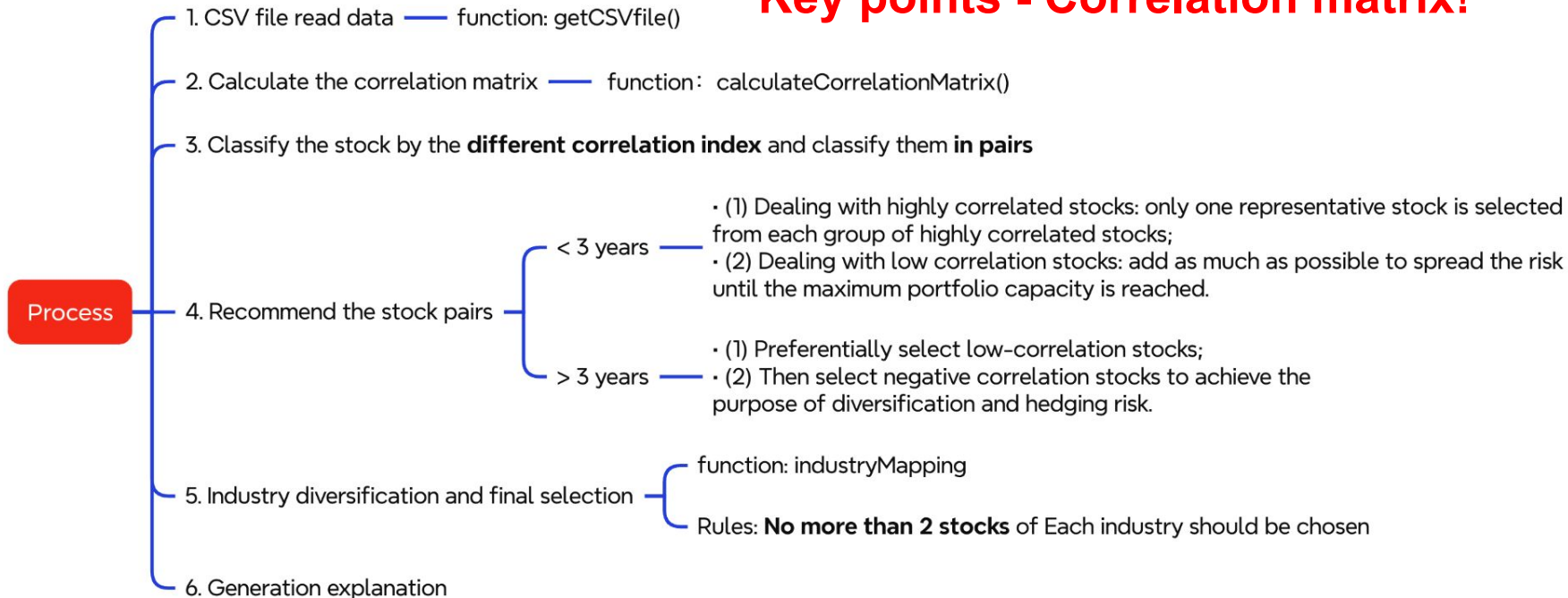
Get AI-Optimized Weights

Compare Methods



Multiple stock module - Prediction process

Key points - Correlation matrix!



Multiple stock module - Prediction correlation matrix



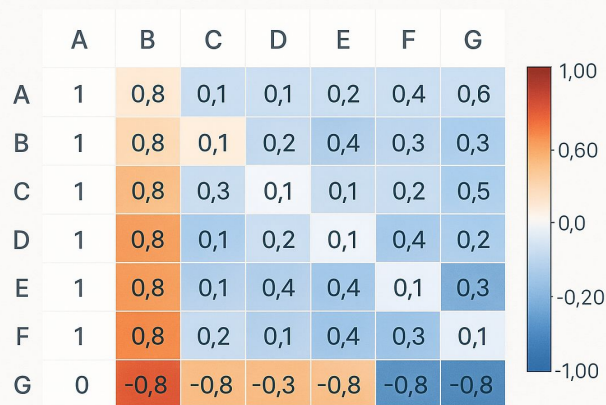
Correlation matrix is a symmetric matrix used to represent pair-to-pair correlations between a set of variables,

- **1: Perfectly positive correlation.**
- **-1: Completely negative correlation.**
- **0: No correlation.**

$$\text{Correlation}(A, B) = \frac{\text{Cov}(A, B)}{\sqrt{\text{Var}(A) \times \text{Var}(B)}}$$

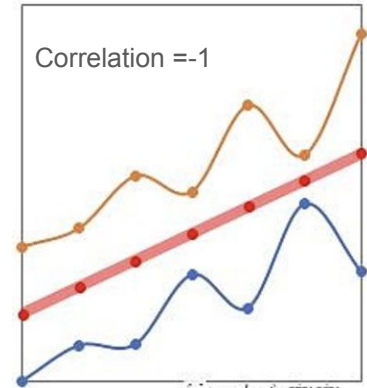
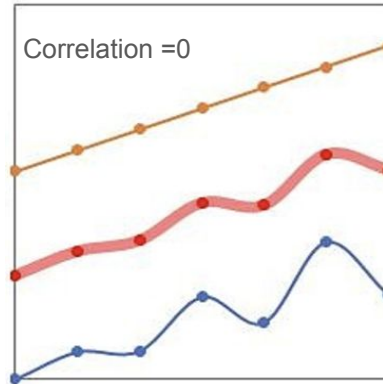
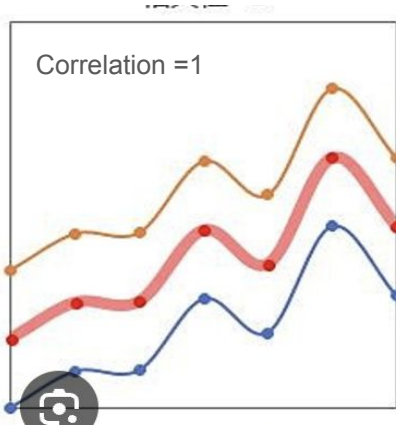
- **Covariance:** Measures the degree to which the prices of two stocks move in tandem.
- **Variance:** A measure of how much the price of a single stock fluctuates.

CORRELATION MATRIX

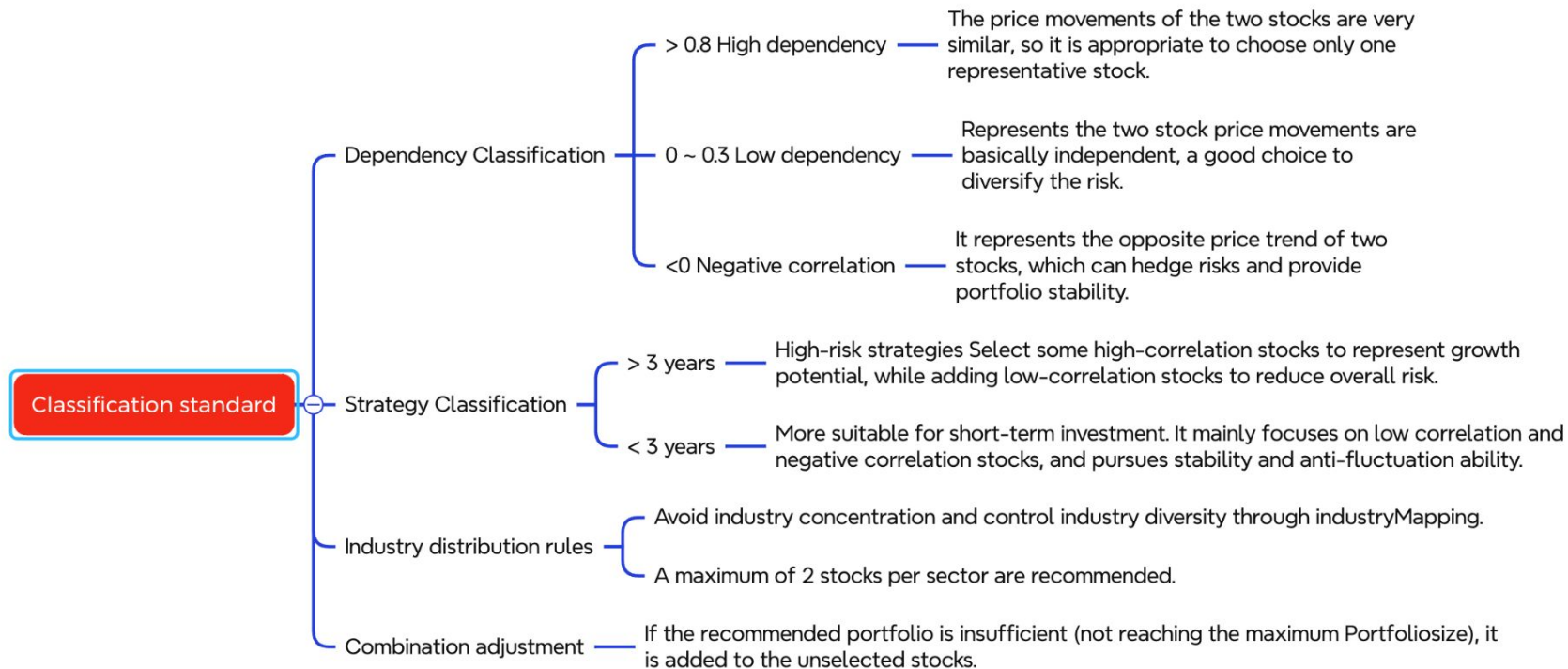


Multiple stock module - Prediction correlation matrix

- If two stocks are **highly correlated** their price changes may be similarly affected by the same market event, and risk cannot be spread.
- If two stocks are negatively correlated, price movements can be partially hedged, reducing the volatility of the portfolio.



Multiple stock module -Prediction classification standard



Multiple stock module - Logistics of Module Portfolio weights

1. Calculate Returns for Each Stock

- Compute the **standard deviation** (risk)
- Compute the **Sharpe ratio** (risk-adjusted return)

2. Calculate the Correlation Matrix

- Measure the correlation between all pairs of stocks

3. Initial Weight Calculation

- Risk-based adjustment: $\text{RiskAdjustment} = \text{risk} / \text{totalRisk}$
- Sharpe ratio adjustment: $\text{SharpeAdjustment} = 1 + (\text{sharpeRatio} / 2)$
- Combined adjustment: $\text{InitialWeight} = \text{riskAdjustment} * \text{sharpeAdjustment}$

4. Correlation Adjustment

- Adjust weights based on the correlation matrix
- Stocks with high correlations will have their weights reduced

5. Weight Normalization

- Ensure the sum of all weights equals 1



Multiple stock module - Calculate weights by AI

STOCK ANALYSIS

Single StockMultiple StocksUser Info & AI AgentLogout

Select Stocks

☐ huohuf1w☐ huohuf1y☐ huohuf2m☐

☐ huohuf3m☐ huohuf6m☒ huohuf9m☐

☒ plbpln1m☐ plbpln3m☐ plbpln6m☐

☐ plopin1m☒ plopin1w☐ plopin1y☐

☐ plopin3m☐ plopin6m☒ plopinon☐

Multiple Stock Analysis Suggestion

Investment Horizon:

1 year

Number of stocks to invest in:

4

Get Stock Recommendations

Analyze Portfolio Weights

Get AI-Optimized Weights

Compare Methods

| Stock | Weight | Stock | Weight |
|----------|--------|----------|--------|
| huohuf9m | 42.00% | huohuf9m | 44.44% |
| plbpln1m | 2.87% | plbpln1m | 5.56% |
| plopin1w | 45.33% | plopin1w | 44.44% |
| plopinon | 9.80% | plopinon | 5.56% |

Input:
Multiple stocks

Output:
Weights of multiple
stocks(Adjustment and AI analysis)

| Weight Adjustments | | |
|--------------------|------------|-----------|
| Stock | Adjustment | Direction |
| huohuf9m | +2.45% | increase |
| plbpln1m | +2.69% | increase |
| plopin1w | -0.89% | decrease |
| plopinon | -4.25% | decrease |

AI Analysis: AI has optimized the portfolio for short-term gains by increasing weights in more volatile stocks that show strong momentum.

AI Recommendations: Consider monitoring market conditions weekly and be prepared to adjust positions based on short-term market movements.



Multiple stock module - Calculate weights by AI

Import modules: Uses Express and OpenAI.

Initialize OpenAI API with apiKey.

Define POST endpoint /ai-predict:

- Accepts stock features from client.
- Constructs a prompt based on these features.
- Sends the prompt to deepseek for portfolio weight suggestions.
- Parses and normalizes AI's response.
- Returns the weights as a JSON array summing to 1.

Multiple stock module - AI Consideration Advantages



AI Analysis Preparation

- Constructs structured prompts
- Incorporates all stock feature information
- Sets analysis objectives and constraints

AI Model Processing

- Utilizes deepseek model for analysis
- Considers risk-adjusted returns
- Evaluates stock correlations
- Analyzes overall portfolio risk
- Takes market conditions into account

| Factor | Traditional Method | AI Method |
|----------------------|----------------------------|--|
| Returns Analysis | ✓ Basic return calculation | ✓ Advanced return analysis with market context |
| Risk Assessment | ✓ Standard deviation | ✓ Multiple risk metrics (VaR, Drawdown) |
| Market Conditions | ✗ Not considered | ✓ Current market environment analysis |
| Correlation Analysis | ✓ Basic correlation matrix | ✓ Advanced correlation with market trends |
| Dynamic Adjustment | ✗ Static weights | ✓ Dynamic weight adjustment |



User information module



User information module - Change password

change password Process

1. Receive request: {old password, new password}
2. Select the users' email from the database
3. Validate old Password (bcrypt.compare) — Invalid oldPassword
--> Return error: 'Invalid old password'
4. Compare old Password with new Password — Same passwords
--> Return error: 'Old and new passwords are the same'
5. Hash newPassword (bcrypt.hash)
6. Update password in database (UPDATE query)

Change Password

Old Password:

New Password:



User information module - deposit money

Deposit money process Process

1. Receive Request: { amount }
2. Update user balance in database (UPDATE query)
3. Release database connection

STOCK ANALYSIS

127.0.0.1:3001 says
deposit successful

User Info & AI Agent

OK

User information

Sell Stock

Change Password

Deposit Amount

AI Agent

Deposit Amount

Current Balance: \$201275.09

Amount:

Deposit



User information module - Sell specific stock

Sell specific stock Process

1. Receive POST Request: /api/sell-stock
2. Validate Input: Ensure timestamp and sellQuantity are valid
3. **Query Database:** SELECT * FROM stock_transactions WHERE timestamp = (input timestamp)
4. Check if Sell Quantity <= Available Stock ——— Sell Quantity > Available Stock
--> Return 400 Error Response (Sell quantity exceeds available stock)
5. Fetch Real-Time Stock Price using fetchRealTimeStockPrice
6. Calculate Sell Amount (**Sell Quantity * Real-Time Price**)
7. Database query
 - Update stock transaction in **table stock_transaction**
 - update user balance in **table stocks**

2025-03-03 02:29:45

huohuf1y

11

Sell

2025-03-03 02:30:40

huohuf1y

12

Sell



AI personalized investment advice

User input

- User email
- User transaction history
- User current balance

Analysis Content

- Investment style
- Analysis of Trading Patterns
- Risk analyze
- Recommendations for action steps

AI Personalized Investment Advice

Based on your historical transactions and account balance, AI provides you with tailored investment advice.

[Get AI Personalized Investment Advice](#)

Analysis of User's Investment Style:

- **Concentration in Specific Stocks**:** The user has primarily traded stocks with names like "huohuf1w," "huohuf1y," "huohuf9m," "huohuf2m," and "huohuf6m." These appear to be highly specialized or niche stocks (possibly sector-specific or leveraged/inverse ETFs). The lack of diversification is a significant risk factor.
- **Short-Term Trading**:** The transactions are concentrated over a few days (May 6 to May 8, 2025), suggesting a short-term or swing trading approach. The user seems to be making quick buys without much selling (only 3 sell transactions out of 15 total).
- **Small Position Sizing with Occasional Large Bets**:** Most purchases are small (e.g., 1-10 shares), but there is one large purchase of 110 shares of "huohuf1y." This inconsistency in position sizing could indicate impulsive decision-making or lack of a clear strategy.
- **Low-Priced Stocks**:** The stocks traded are all priced around \$6.50, which might indicate a preference for low-priced, potentially volatile stocks.
- **Current Portfolio Composition**:** Assuming no sales, the user's current holdings are:
 - huohuf1w: 17 shares
 - huohuf1y: 117 shares
 - huohuf9m: 8 shares
 - huohuf2m: 4 shares
 - huohuf6m: 4 sharesTotal invested ≈ \$1,000 (based on average price of \$6.50/share), leaving ~\$2,500 in cash.

Personalized Investment Advice:

Recommendations:

- **Diversify Your Portfolio**:**
 - The current portfolio is heavily concentrated in a few similar stocks, exposing you to significant sector-specific risk. Consider adding:
 - Broad-market ETFs (e.g., SPY, VTI) for stability.
 - Blue-chip stocks (e.g., AAPL, MSFT) for long-term growth.
 - Bonds or dividend-paying stocks (e.g., VZ, PG) for income.



AI Agent part



User information module - AI Agent

User information

Sell Stock Change Password Deposit Amount **AI Agent**

Deposit Amount

Current Balance: **\$3537.15**

Amount:

Enter amount to deposit

Deposit

- **AI Agent:** click the button and it will go to the <http://localhost:5001>



User information module - AI Agent Demo



User information module - AI Agent

API Configuration:

DeepSeek API key

Model Name

Basic Settings:

Number of Agents

Total Simulation Days

Daily Trading Sessions

Stock Initial Settings

Stock A/B initial Price

Agent Initial Property

Max/Min initial property

Loan Settings

Features:

It will analyze two stocks

It will make a more comprehensive inference based on the financial reports and the market

Configure Simulation Parameters

API Configuration

DeepSeek API Key:

sk-844e8505444a4c80b0b251cd914d05e3

Caution: Avoid exposing sensitive keys in client-side code in production.

Model Name (for Agent & Secretary):

deepseek-reasoner

Basic Settings

Number of Agents:

20

Total Simulation Days:

180

Daily Trading Sessions:

3

Stock Initial Settings

Stock A Initial Price:

30

Stock B Initial Price:

40

Agent Initial Property

Max Initial Property:

5000000.0

Min Initial Property:

100000.0

Loan Settings

Loan Types (comma-separated names, e.g., one-month,two-month):

one-month,two-month,three-month

Loan Durations (comma-separated days, corresponding to types):

22,44,66

Must match the number of loan types. Enter positive integers.

Loan Rates (comma-separated, e.g., 0.027,0.03,0.033):

0.027,0.03,0.033

Must match the number of loan times. Enter positive decimals.



User information module - AI Agent

100%

Today's Actions & Executions

| Day | Sess | Agent | Type | Action | Stock | Qty | Price | Detail / Counterparty |
|-----|------|-------|----------|--------|-------|-------|-------|-----------------------|
| 2 | 1 | 1 | Decided | sell | B | 10000 | 40.40 | - |
| 2 | 1 | 0 | Decided | sell | B | 10000 | 40.50 | - |
| 1 | 1 | 0 | Executed | buy | B | 5000 | 40.10 | Buy:0/Sell:1 |
| 1 | 1 | 1 | Decided | sell | B | 5000 | 40.10 | - |
| 1 | 1 | 0 | Decided | buy | B | 10000 | 40.10 | - |

Live Event Feed

Prediction (for Day 3): Agent 1 -> Loan:no, BuyA:no, SellA:no, BuyB:no, SellB:yes

Prediction (for Day 3): Agent 0 -> Loan:no, BuyA:yes, SellA:no, BuyB:no, SellB:yes

Price Update (D2 S1 End): Stock A: 30.00, Stock B: 40.10

Session 1 Started

Loan Decision (Day 2): Agent 1 decided not to take a loan.

Loan Decision (Day 2): Agent 0 decided not to take a loan.

---- Day 2 Started ----

Forum Post (Day 1 End): Agent 1 says:

****Conservative Trading Recap – Day 1****

- ****Sold 5,000 shares of Stock B at 40.1**** to trim exposure amid regulatory uncertainty, locking in gains while retaining a core position.
- ****Held Stock A (21,207 shares)****—stable fundamentals and potential turnaround under new leadership justify patience.
- ****No new loans****—maintaining low leverage aligns with risk management.

***Key Takeaway*:** Discipline over speculation. Reduce risk where needed, hold steady where fundamentals support long-term value.

Good luck tomorrow, traders."

Forum Post (Day 1 End): Agent 0 says:

****Trading Tip for Today (Day 1):****

- **AI Agent:** click the button and it will go to the <http://localhost:5001>



User information module - AI Agent

Forum Post (Day 2 End): Agent 1 says:

****Conservative Trading Recap – Day 2****

- ****Sold 10,000 shares of Stock B at 40.4**** to lock in gains and reduce regulatory risk exposure, while retaining a core position.
- ****Held Stock A (21,207 shares)****—awaiting clearer signs of turnaround under new leadership.
- ****No new loans****—maintaining low leverage aligns with risk discipline.

Key Takeaway: Patience and selective profit-taking. Trim speculative positions (B) and hold steady where fundamentals support long-term value (A).

Good luck tomorrow, traders.

Forum Post (Day 2 End): Agent 0 says:

****Trading Tips for Today:****

- ****Stock A (Chemicals):**** Showing signs of turnaround with new leadership and government support. Revenue stabilizing, cash flow improving. Good long-term value at current price. ****Bullish.****
- ****Stock B (Tech):**** Strong growth but concerns remain about past reporting. Taking partial profits here after recent run-up. Still positive outlook but cautious. ****Neutral/Slightly Bearish short-term.****
- ****Portfolio Adjustment:**** Trimmed some B to increase A exposure. Holding cash for potential opportunities.

Trade wisely and manage risk! 🚀

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****"Conservative Trading Recap – Day 1****

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- ****Held Stock A (21,207 shares)****—stable fundamentals and potential turnaround under new leadership justify patience.
- ****No new loans****—maintaining low leverage aligns with risk management.

Key Takeaway: Discipline over speculation. Reduce risk where needed, hold steady where fundamentals support long-term value.

Good luck tomorrow, traders."

Forum Post (Day 1 End): Agent 0 says:

****Trading Tip for Today (Day 1):****

****"Stock B (Tech) remains a strong buy—despite past governance concerns, growth projections (+20% revenue) and government support signal upside. Stock A (Chem) is a hold; wait for clearer signs of turnaround under new leadership. No rush to add debt—cash reserves are sufficient for now. Monitor B's price action closely tomorrow."***

(Posted publicly to trader forum.)



Frontend design

HTML: overall layout

Two forms: Login form and registration form, with the login form displayed by default, and the registration form shown when a button is clicked.

Element breakdown:

Input fields: Used for the user to enter their username and password (<input> tag).

Buttons: Used for the user to perform login or registration actions (<button> tag).



Technical Details

- Frontend: HTML, CSS, JavaScript for user interaction.
- Backend: Node.js with Express.js for server-side logic.
- Database: MySQL for storing user and stock data.
- APIs: Facilitate communication between frontend and backend.
- Utility Libraries:
 - bcrypt.js (Hash users' password)
 - Csv-parser (Read CSV file)
 - Moment.js
 - Math.js (Used to calculate some functions for stock broadcast)



Contribution

Juncheng Zhao

- Frontend Design: Page design
- Backend: Login module design, Single stock module design, Multiple Stock Module(AI Design)
- PPT design

Siyi Chen

- Backend Design: User information module, Multiple stock module, Database creation and operation
- Frontend Design: Page design
- PPT design

Yiwei Li

- AI Agency Design
- Backend Design: Single stock purchase design, User information design
- PPT Design



Thank you