

Team 003 Introduction	3
Team Structure	4
Code standard	6
Tools Used	10
Product Information	11
Requirement Analysis	12
User Stories	13
Design diagrams	15
UI Design Overview	19
Personas	21
Artifacts Sprint 1	22
Artifacts Sprint 2	23
Artifact Sprint 3	24
Settings	25
FrontEnd Setting	26
BackEnd Setting	27
Meeting Minutes	28
Sprint 1 Meeting Notes	31
Week 2 Scrum Meeting Notes	32
Week 3 Scrum Meeting Notes	34
Week 4 Workshop notes	36
Week 4 Work Allocation Notes	37
Week 5 Scrum Meeting Notes	38
Week 5 Work Allocation Notes	40
Sprint 2 Meeting Notes	41
Week 7 Scrum Meeting Notes	42
Week 8 Scrum Meeting	43
Week 8 Scrum Meeting 2	44
Week 9 Scrum Meeting	47
Sprint 3 Meeting Notes	49
Week 10 Scrum Meeting Notes	50
Week 10 Work Allocation Meeting	52
Week 11 Scrum Meeting	53
Week 11 Work Allocation Meeting	55
Week 11 Group Practice of Presentation	57
Week 12 Scrum Meeting	58
Week 13 Scrum Meeting	59
Product Backlog	60
Sprint Planning	62
Sprint 1 Planning	63
Sprint 1 Backlog	66
Sprint 2 Planning	67
Sprint 2 Backlog	70
Sprint 3 Planning	71
Sprint 3 Backlog	74

Sprint Review.....	75
Sprint 1.....	76
Sprint 1 Retrospective Meeting.....	77
Sprint 1 Product Review Meeting 1.....	78
Sprint 1 Product Review Meeting 2.....	79
Sprint 1 Reflection.....	81
Sprint 2.....	82
Sprint 2 Retrospective Meeting.....	83
Sprint 2 Product Review Meetinng.....	85
Sprint 3.....	87
Sprint 3 Retrospective Meeting.....	88
Sprint 3 Product Review Meeting.....	91
Team Communication.....	92
Testings.....	94
Test planning for frontend.....	95
Test planning for UI design.....	97
Test Planning for AI Generation.....	99
Test planning for backend.....	101
Test Report: PythonProblemGenerator Manual Test Execution.....	103
Test Report: PythonCodeGenerator Manual Test Execution.....	106
Test Report: IDE Execution System.....	112
User Feedback Report.....	118
Client Communication.....	122
Week 3 Client Meeting.....	123
Week 6 Client Meeting.....	125
Week 9 Client Meeting.....	126
Deployment Enquiry.....	128
Team Decisions.....	129
Sprint 2 Decision Backlog.....	130
Encode IP Addresses.....	131
CSV Files Generation.....	133
Include IDE Warnings.....	135
Indentation Implementation.....	137
Backend Setup.....	139
Sprint 3 Decision Backlog.....	141
Remove Completeness Bar.....	142
Present Live Demo.....	144
Automated and Manual Testing.....	146
Add Hint.....	148
Final Product - Deployment.....	150
Deployment.....	152
Deployment Plan.....	154
Product Presentation.....	155

Team 003 Introduction

Team Name: Deadline Dominators

Sprint Duration:

- First Sprint - 4 weeks
- Second Sprint - 3 weeks

Team Structure



Code Standard



Tools Used





Team Structure

Role Map

Scrum Master:

Howard Li

Email: howard3@student.unimelb.edu.au

Product Owner:

Yiru Liu

Email: yirul6@student.unimelb.edu.au

Development Team:

Howard Li

Email: howard3@student.unimelb.edu.au

Yan Gong

Email: yagong1@student.unimelb.edu.au

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Email: jiawang10@student.unimelb.edu.au

Yifan Zhang

Email: yifanzhang@student.unimelb.edu.au

Yiru Liu

Email: yirul6@student.unimelb.edu.au

Responsibility Overview

FrontEnd:

Howard Li, Jiayi Wang, Yiru Liu.

Backend:

Howard Li, Yan Gong, Yifan Zhang.

2 Sprint 2 Role Assignments

Development Team Member	Role(s)	Notes
@Howard Li	Frontend coding; API Integration	<ul style="list-style-type: none">Continue to develop the frontend code according to the UI prototype design.Connecting the Frontend to Backend.
@Yifan ZHANG	Update database	<ul style="list-style-type: none">Update the database according to client's needsTesting Database
@Yan Gong	Update AI Prompt; Set-up python IDE.	<ul style="list-style-type: none">Refine the AI prompt by modifying the prompt and compare the output; solve

		<ul style="list-style-type: none"> issues related to CSV Read/Write. Configure python environment. Testing AI generation
@Jiayi Wang	Update UI prototype design	<ul style="list-style-type: none"> Update prototype design according to Backend updates. Testing Front-end
@Yiru Liu	Maintain Jira and Confluence	Sprint Planning; Holding meetings and record meeting notes; decision making.

3 Sprint 3 Role Assignments

Development Team Member	Specialized Role(s)	Notes
@Howard Li	Frontend coding; API Integration	<ul style="list-style-type: none"> Refine the frontend look. Solve issues arisen in frontend testing.
@Yifan ZHANG	Maintain database	<ul style="list-style-type: none"> Testing Database
@Yan Gong	<ul style="list-style-type: none"> AI Generation Testing Frontend Testing 	<ul style="list-style-type: none"> Ensure that AI can generate validated questions
@Jiayi Wang	<ul style="list-style-type: none"> Finalize UI prototype design Frontend Automated testing 	<ul style="list-style-type: none"> Finalize the prototype in the aspects include font and admin avatar.
@Yiru Liu	<ul style="list-style-type: none"> Maintain Jira and Confluence Manage Presentation 	<ul style="list-style-type: none"> Following agile ceremonies, specially: Sprint Planning; Holding meetings and record meeting notes; decision making. Design PowerPoint; arrange presentation meetings.

Code standard

Code Standards for CodeCraft

This document outlines the coding standards, conventions, and best practices to follow when contributing to this project. Consistent coding standards ensure that the code is readable, maintainable, and easier to debug.

1. General Principles

- **Readability:** Code should be easy to read and understand.
- **Consistency:** Use a consistent coding style across the project.
- **Simplicity:** Avoid complex structures when a simpler solution exists.
- **Documentation:** Code should be well-documented, especially for complex functions or components.
- **Efficiency:** Strive to write performant and optimized code without compromising clarity.

2.1 Project Structure (frontend)

```
1 src/
2   |   └── assets/          # Images, fonts, static resources
3   |   └── components/     # Reusable Vue components
4   |   └── router/         # Vue Router configurations
5   |   └── services/        # API interaction logic
6   |   └── App.vue          # Root component
7   |   └── main.js          # Entry point for Vue app
8
9
```

2.2 Project Structure (backend)

```
1 src/
2   |   └── main/
3   |   |   └── java/com/example/project/  # Java code
4   |   |   |   └── config/                # Configuration files
5   |   |   |   └── controller/           # REST API controllers
6   |   |   |   └── service/              # Service layer
7   |   |   |   └── mapper/               # MyBatis mappers
8   |   |   |   └── model/                # Domain models/Entities
9   |   |   └── resources/             # MyBatis XML files
10  |   |   |   └── mapper/             # MyBatis XML files
11  |   |   |   └── application.yml      # Configuration file
12  |   └── test/                  # Unit and integration tests
13
```

3. Naming Conventions

Files and Folders

- **JavaScript/TypeScript Files:** Use `camelCase` for filenames (e.g., `userProfile.js`).
- **CSS/SASS Files:** Use `kebab-case` (e.g., `main-style.css`).
- **Components:** Use `PascalCase` (e.g., `UserProfile.vue`).

- **Classes:** Use `PascalCase` (e.g., `UserService.java`).
- **Interfaces:** Prefix with `I` (e.g., `IUserService.java`), though this is optional if interfaces are used consistently across the project.
- **Configuration Files:** Use `camelCase` (e.g., `myBatisConfig.xml`).

Variables and Functions

- **Methods and functions:** Use `camelCase` (e.g., `getUserById()`).
- **Variables:** Use `camelCase` (e.g., `userName`, `age`).
- **Constants:** Use `UPPER_SNAKE_CASE` for constants (e.g., `MAX_USERS`).

Classes and Interfaces

- **Classes:** Use `PascalCase` (e.g., `UserProfile`).
- **Interfaces:** Prefix with `I` and use `PascalCase` (e.g., `IUserProfile`).

4. Commenting and Documentation

- Write comments that explain the "why" behind complex logic.
- Every method and function should have a comment describing what it does, its input parameters, and its return values.
- Use **JavaDoc** to document classes, methods, and fields.

5. Code Formatting

- Use **4 spaces** for indentation.
- **Maximum line length:** 100 characters.
- **Braces:** Always use braces for control structures (even if optional).
- **Spacing:**
 - Around operators: `const x = 5 + 10;`
 - After commas: `function(x, y, z)`
 - No space after function name and before parentheses: `function myFunction()`

6.1 Database Interaction with MyBatis

- Use **parameterized queries** to prevent SQL injection:

```

1  @Select("SELECT * FROM users WHERE id = #{id}")
2  User getUserById(int id);

```

- For complex SQL queries, use MyBatis XML files to avoid cluttering the code:

```

1  <select id="getUsersByAge" resultType="User">
2      SELECT * FROM users WHERE age = #{age}
3  </select>
4

```

- Use **result mappings** in XML to map complex queries:

```

1  <resultMap id="UserMap" type="com.example.model.User">
2      <id property="id" column="user_id"/>
3      <result property="name" column="user_name"/>
4  </resultMap>
5

```

6.2 Controller Layer

- **RestController:** Use `@RestController` for REST APIs, returning JSON by default.

```
1  @RestController
2  @RequestMapping("/api/users")
3  public class UserController {
4
5      @Autowired
6      private IUserService userService;
7
8      @GetMapping("/{id}")
9      public ResponseEntity<User> getUser(@PathVariable int id) {
10         User user = userService.getUserById(id);
11         return ResponseEntity.ok(user);
12     }
13 }
14 }
```

- **Response Handling:** Always return appropriate HTTP status codes:

- `200 OK` for success.
- `400 Bad Request` for validation errors.
- `404 Not Found` for missing resources.
- `500 Internal Server Error` for unhandled exceptions.

- **Validation:** Use `@Valid` and `@RequestBody` to validate inputs.

7. Configuration and Properties

- Use `application.yml` for configuring environment-specific properties (e.g., database settings, MyBatis configuration).

```
1  spring:
2      datasource:
3          url: jdbc:mysql://localhost:3306/mydb
4          username: root
5          password: password
6
7      mybatis:
8          mapper-locations: classpath:mapper/*.xml
9          type-aliases-package: com.example.model
10 
```

8. Error Handling

- Always handle errors gracefully.
- Use `try/catch` blocks for asynchronous code:

9. Version Control (Git)

- Use meaningful commit messages. Example format:
 - `correct user profile fetching issue`
 - `add new search functionality`
- Branch naming: Use a clear naming scheme for branches:
 - `/programmerName`

10. Security Best Practices

- Avoid exposing sensitive data such as API keys.
- Always sanitize user inputs to prevent XSS, SQL Injection, etc.
- Use HTTPS for secure communications.
- Use **parameterized queries** to prevent SQL injection.
- Implement **authentication and authorization** (e.g., Spring Security, JWT).
- **Never store sensitive information** (e.g., passwords, API keys) in plain text.

11. Performance Optimization

- Avoid unnecessary re-renders in the UI (Vue/React).
- Lazy load components where possible.
- Use pagination for large datasets instead of rendering all at once.
- Lazy loading: Configure MyBatis to use lazy loading where appropriate.
- Batch operations: Use batch inserts/updates to improve performance on bulk operations.

 Tools Used

Tool	Purpose
Slack	Team internal communication
Confluence	Organize work
Jira	Work allocation
IntelliJ	IDE Coding
MySQL	Database processing
Draw io	Design diagrams
ChatGPT	Ask questions
Gemini	Generate questions
Figma	UI design
Vue	Frontend framework design
SpringBoot3	Backend framework
GitHub	Version control
Docker	Configuring python environment
AWS cloud	Deployment

Product Information

 Introduction of features of our website

 Requirement Analysis

 User Stories

 Design diagrams

 UI Design Overview

 Personas

 Artifact Sprint 3



Requirement Analysis

Functional Requirements

1. **AI-Generated Questions** - The system will allow users to input questions, and ChatGPT will generate relevant code snippets based on the selected module and the content of the user's question. The system will validate the correctness of the code snippets generated by ChatGPT before presenting them to the user. Users will have the option to either attempt to solve the generated question or request a new question.
2. **Interactive Coding Interface** - The platform will provide an interactive interface for Parson's Problems, enabling users to reorder code segments through a drag-and-drop feature. Users will be able to execute the reordered code within the interface, and the system will provide real-time feedback.
3. **Feedback System** - After code submission, the system will generate feedback just like running program in a python integrated development environment (IDE), including error alerts and suggestions for improvement. Feedback will be immediate, helping users identify mistakes and understand the logic behind the code.
4. **Analysis System** - The system will track user performance and provide analytical reports, including metrics like correct answer rates, number of attempts, and time spent on each problem. These reports will help users monitor their learning progress, identify weaknesses, and adjust their study strategies.
5. **Admin Account** - Administrators will have access to all the features available to regular users, with additional capabilities to view and manage all users' analytical reports.

Non-Functional Requirements

1. **Usability** - The user interface (UI) will be designed for ease of use, with a focus on aesthetics, consistency, and intuitive navigation. The system will support different user roles (students and administrators) with role-specific UI elements.
2. **Performance** - The system will provide prompt feedback within seconds of code submission to maintain a smooth user experience. Page load times and response times for actions like dragging and dropping code snippets or generating reports should be minimal.
3. **Availability** - The system will be designed for high availability, ensuring that users can access the platform at any time with minimal downtime. The platform will include measures for fault tolerance and disaster recovery to maintain service continuity.
4. **Security** - User data privacy will be prioritized, with secure authentication mechanisms for admin accounts. The system will support anonymous access for students to protect their privacy. Security measures will be in place to protect against unauthorized access, data breaches, and other security threats.



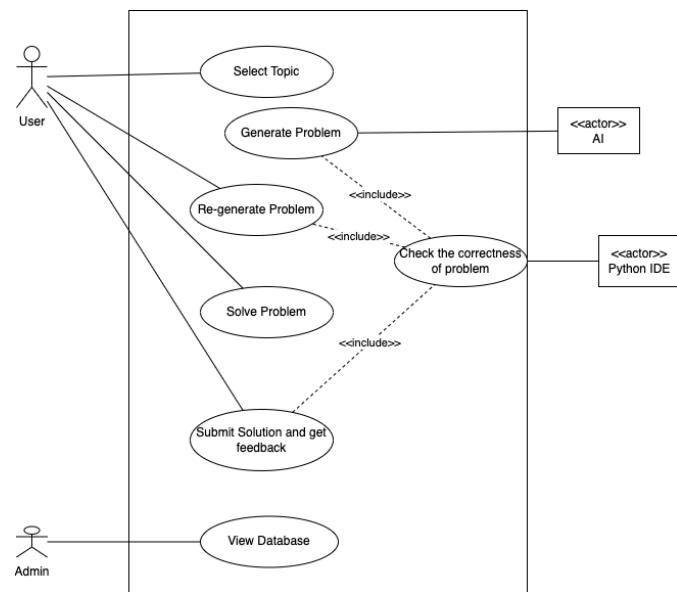
User Stories

ID	As a	I want to	So that	Priority
1	User	select a topic that I want to learn.	improve knowledge in specific area.	High
2	User	select a specific context that I want to learn.	I can learn specific knowledge	High
3	User	have the choice to re-generate code.	I can skip something that I don't want to learn or I have already learned.	High
4	User	know whether my answer is correct or not	I can try to fix my answer as soon as possible	High
5	User	get feedback of IDE as soon as I submit my code.	I can understand my mistakes and improve it.	Medium
6	User	be able to use the platform anonymously	protect my privacy	High
7	User	see a summary report showing my progress and performance	I can understand my strengths and weaknesses	High
8	User	see the description of question and corresponding code	I can know what type of problem the code solves.	High
9	User	expand or hide the description of question at any time	there could be more spaces for me to do the question	Low
10	User	be able to see the hint to a particular question	I can get some help when I find myself stuck.	Medium
11	User	get questions generated by the LLM model to be consistent in quality, relevance, and difficulty level	ensure a fair and balanced assessment or interaction experience.	High
12	User	get code generated by the LLM model to be correct and functional based on the questions generated previously.	ensuring that the output is reliable and accurate for use in real-world applications.	High
13	User	get each code block indented by clicking on the block	I can get to practice Python Indentation.	Medium

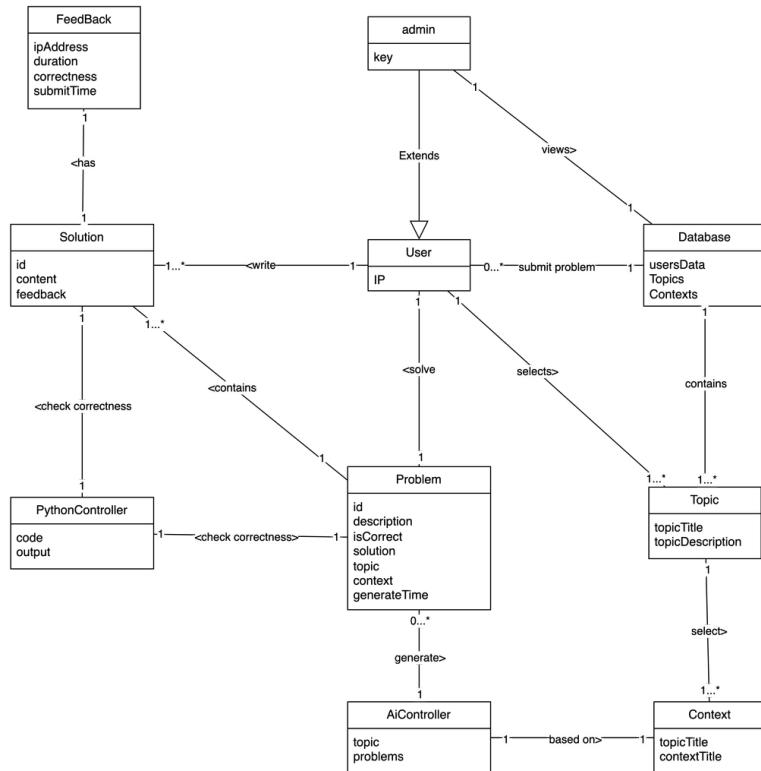
14	User	not show my IP addresses to administrators	I can protect my privacy.	Medium
15	Admin	have all the functions that student account have	I can know the scope of knowledge that students can acquire through experimentation.	High
16	Admin	a summary of the anonymous forms of student response performance	I can know which topic that students are lacking in.	High
17	Admin	logIn in based on the predefined admin key	I can access to the system with higher privileges.	High

Design diagrams

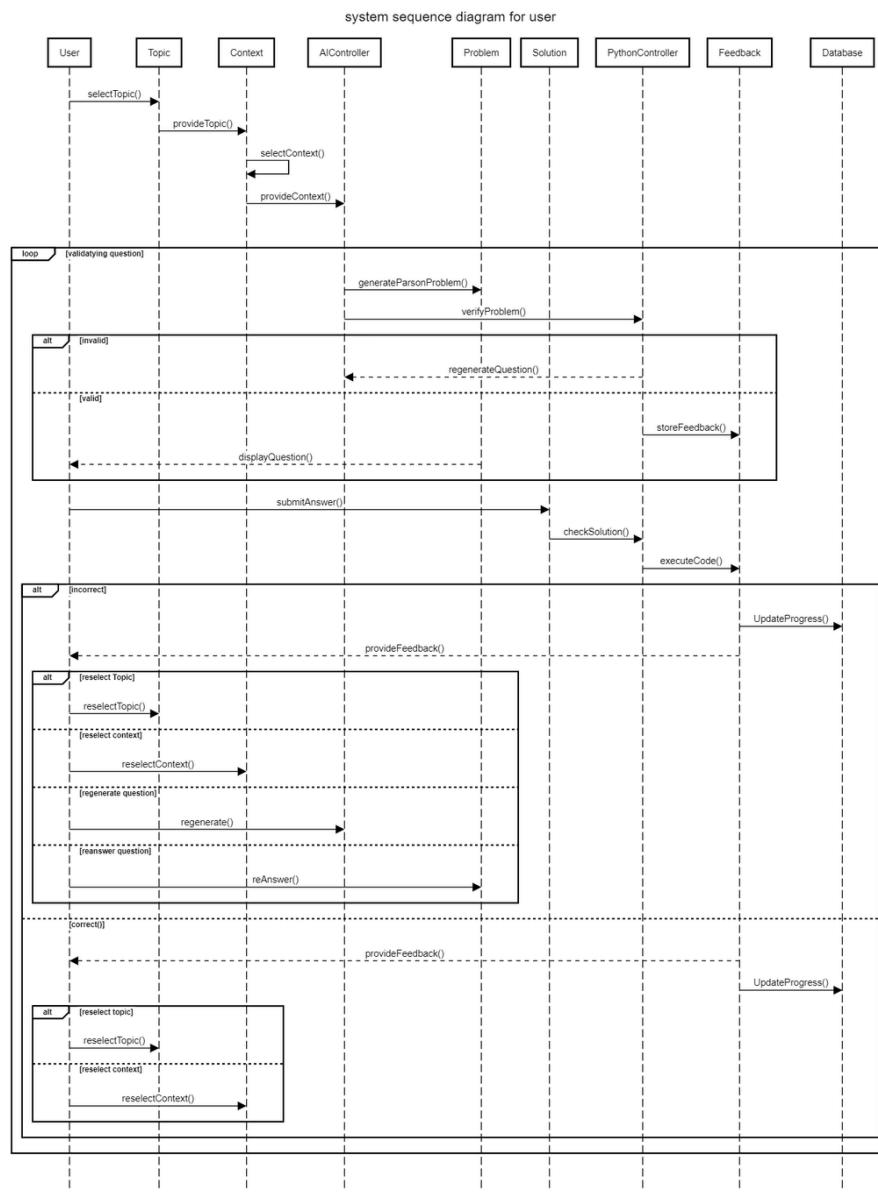
User Case Diagram



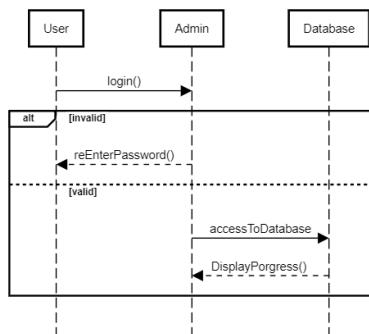
Domain Model



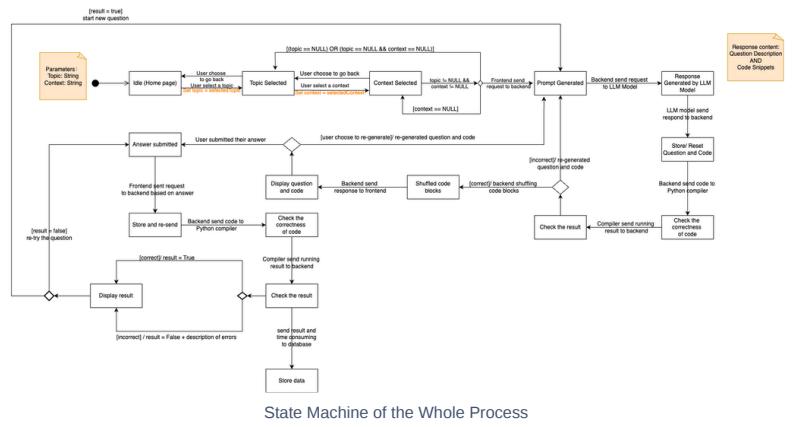
Sequential Model (updated)



system sequence diagram for admin

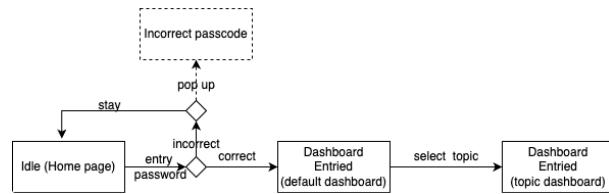


State Machine



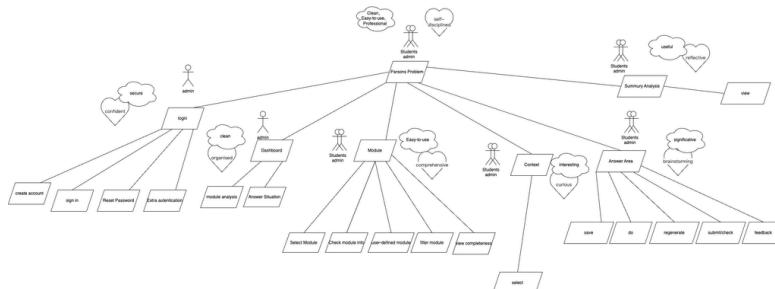
State Machine of the Whole Process

StateMachine for Admin Page



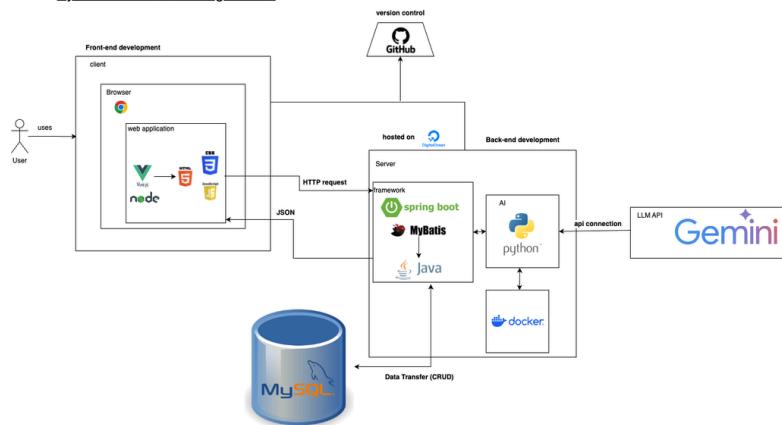
State Machine of Admin Page

Motivational Model



Architecture Model

System ArchitectureDesign Model





UI Design Overview

@Jiayi Wang

UI Design Prototype: [Parsons Problem UI Design](#)

Design description

Component	Description
Theme color	The main theme color is light green; also use yellow and orange elements.
Design style	Interesting but not too complicated; easy to use. The elements are relevant to themes of computing and machine learning.
Buttons design	Buttons are obvious, and their positioning needs to be logical.
Homepage	Dynamic and 3D effects which represents the unique style of our website.

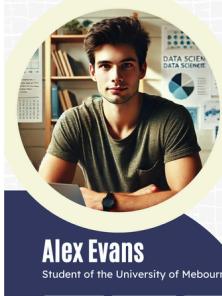
Functionality Implementation

Component	Description
Homepage	<ul style="list-style-type: none">Logo and sloganNavigation barIntroduction of main functionsAdmin login button - after logging in, the administrator will be directed to the Dashboard page.Start button that allows students to start doing questions directly. The button will direct students to the Module page.
Navigation bar	<ul style="list-style-type: none">logo and Admin login, fixed at the top of the screen.
Dashboard - Admin	This is the page that administrator can see analytics of students' ability to answer the questions in different aspects. <ul style="list-style-type: none">Proportion of correct answers for each module - this is represented by pie chart.Activity summary - with columns including User ID, selected topic (module), selected context, TimeStamp of the problem generated, time taken by students, correctness.
Module Page	The module page is where the students pick a topic of questions they are willing to do. <ul style="list-style-type: none">Each module represents 1 of the 7 COMP20008 related topics. Clicking any of the module will direct the user to the question page of corresponding topic.Every module has a unique corresponding color and icon, and a toughness rating.Each module also contains a degree of completion. A gold medal will appear on the module if the student has 100% completeness in the corresponding module.

Context Page	<p>After selecting one Module page, the context page allows students to select the scenario they are interested in. Each scene will be automatically generated by AI a background introduction, so that students can understand the problem more thoroughly through the description of the real scene</p> <ul style="list-style-type: none"> • Each module contains 5-7 contexts, and each context is derived from real life scenarios. • After Module is selected, the theme color of the Context page is the same as the representative color of module. • Each module also contains a degree of completion. A gold medal will appear on the module if the student has 100% completeness in the corresponding module.
Question Page	<ul style="list-style-type: none"> • main feature: drag and drop lines of code into appropriate area to make the ordering correct • <u>Regenerate</u> button: Student can choose to click this button if they wish to skip the current question. The website will then regenerate a new question related to the chosen topic. • <u>Check It!</u> button: This button is designed for submission. This allows students to check the correctness as soon as they complete each problem. By clicking this button, the <u>IDE Feedback</u> window will appear on the page.
IDE Feedback Window	<ul style="list-style-type: none"> • This window gives user the IDE feedback of running their result in the build-in online compiler. • There is a <u>Feedback</u> button located bottom left. Clicking it will make the website show a window containing <i>Timer</i> (Duration of answering this problem), <i>Attempts</i> (Number of times the user have attempted the same question) and <i>Accuracy</i> (proportion of how many times out of total the student has answered the question correctly). • <u>Retry</u> button: Allows student to re-attempt the same question. • <u>Next</u> button: Moving onto the next question of the same topic.
Analysis pop-up window	<p>After submitting the question, the system will generate the current completion of the question.</p> <p>The analysis page is a pop-up window placed in the center of the screen. The theme color is green with highly relevant illustrations.</p> <p>The analysis content mainly includes mainly includes:</p> <ul style="list-style-type: none"> • How many times have I done this problem in total. • How long did it take to do this problem.



Personas



Alex Evans
Student of the University of Melbourne

Diligent Curious Analytical

BIO
Alex is a undergraduate student of Unimelb majoring in Data Science. He is currently enrolled in COMP20008. His favorite motivational phrase is 'Practice Makes Perfect.'

GOALS
Master all the basics of data processing and build a strong foundation of Python, so that he can perform well in the COMP20008 assignments and final exam.

PYTHON CODING SKILLS

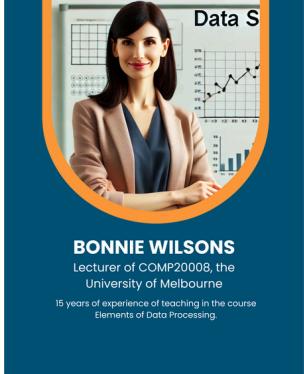
- Debugging
- Problem-Solving

TECH-SAVVY
Alex is competent in Python with a good understanding of basic data analysis skills. However, he feels insecure in his algorithmic thinking and problem solving skills.

PAIN POINTS
Finds topics of Decision Tree Classifier and Nonlinear Regression Information particularly struggling, especially when his code doesn't work as expected. Even worse, COMP20008 doesn't offer many opportunities to practice coding.

BEHAVIOUR
Actively engages in studying coding with online resources. Frequently revisits course materials and values educational tools that provide instant feedback, are easy and interesting to use, and offer practical examples.

MOTIVATIONS
Driven by academic success and a desire to excel in data science, Alex is focused on practicing coding skills relevant to data processing.



BONNIE WILSONS
Lecturer of COMP20008, the University of Melbourne
15 years of experience of teaching in the course Elements of Data Processing.

MOTIVATIONS
Bonnie is highly motivated by seeing her students grasp data processing knowledge and master the relevant coding skills. She wishes to seek out new resources and engaging learning tools to enhance her lessons.

PAIN POINTS
Bonnie has limited time of grading and providing feedback and limited energy of managing large groups of people. She also finds some of the students reluctant to practice coding or weak in coding.

GOALS
Monitor student progress and identify areas of difficulty, so that she could provide targeted consultation support.

TECH-SAVVINESS
Proficient with educational technology like Grok and Ed but values straightforward, intuitive tools that both helps students to improve their coding skills and save her grading time.

DEDICATED PROFESSIONAL SMART



Artifacts Sprint 1

UI Design

The screenshot shows a landing page for 'E-Studieses'. At the top right is a green button labeled 'admin login'. The main title 'Data collection and integration' is displayed prominently. Below it is a short text snippet: 'Lorem ipsum dolor sit amet, consectetur adipiscing elit. Arcu diam ut condimentum lacinia. Sagittis, maeccenas sed tristique dolor sed. Mauris nunc fames tincidunt id hac lacus, donec. Pellentesque amet cursus morbi enim fringilla mi pellentesque a lorem.' To the right of the text is a cartoon illustration of a person in a dynamic pose, surrounded by floating icons like a checklist, a gift box, and a gear. At the bottom are two buttons: 'Start' (green) and 'Learn More' (white). The video player controls at the bottom indicate the video is at 0:00 / 1:12, 1x speed.

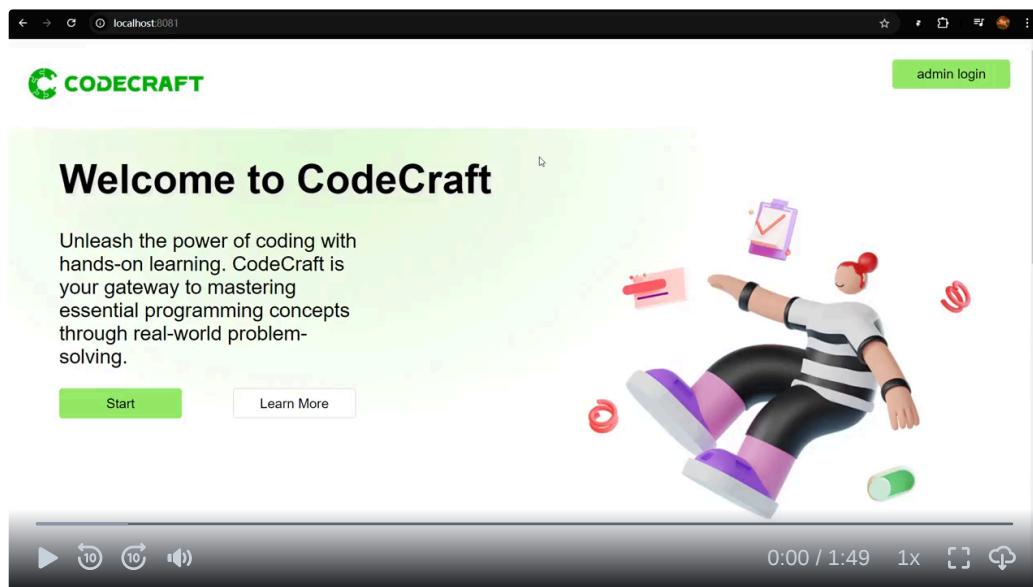
Front-End

The screenshot shows a front-end development environment for a 'Linear Regression: WoolWorth' task. On the left, there's a sidebar with 'Logo', 'Topics', and 'contexts'. The main area has tabs for 'Scenario', 'Task', and 'Hint'. The 'Scenario' tab contains a story about a retailer trying to understand the relationship between advertising spend and sales revenue. The 'Task' tab contains instructions to build a model predicting sales revenue based on advertising spend. The 'Hint' tab provides a tip: 'Learn Angular js to build a beautiful landing page for your business...'. To the right, there are two sections: 'Drag from here' containing code snippets (e.g., 'import pandas as pd', 'new_advertising_spend = [[10000]]'), and 'Drop blocks here' which is currently empty. The video player controls at the bottom indicate the video is at 0:00 / 2:20, 1x speed.



Artifacts Sprint 2

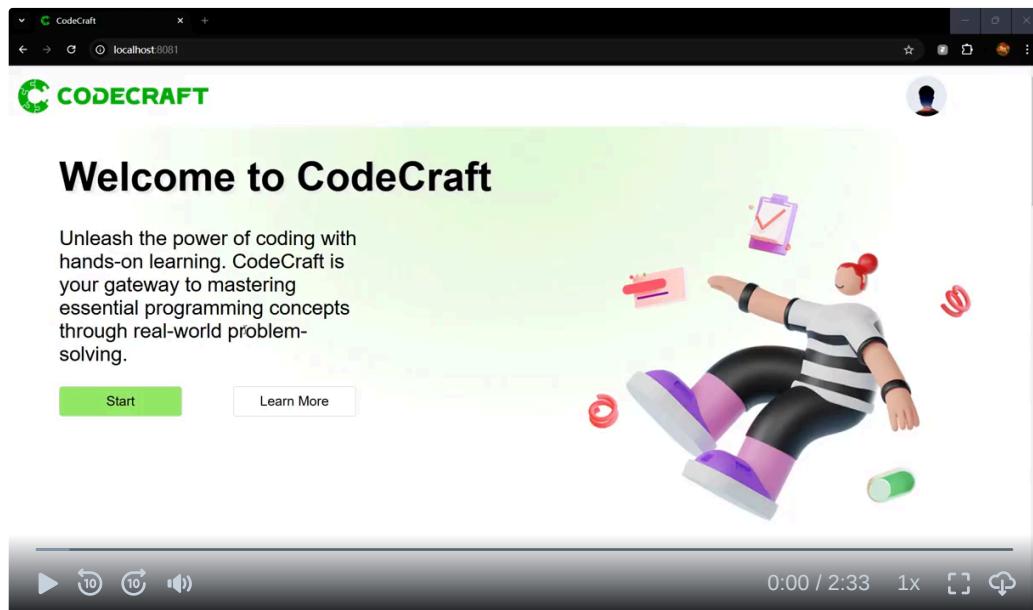
Product





Artifact Sprint 3

Product



Settings

FrontEnd Deployment:

 [FrontEnd Setting](#)

BackEnd Deployment:

 [BackEnd Setting](#)

FrontEnd Setting

To run frontend on local machine:

1. Navigate to the "frontend" folder in your file system.

```
1 cd .\frontend\
```

2. Launch a terminal or command prompt.

3. Install required packages by executing:

```
1 npm install
```

4. Compile the project with:

```
1 npm run dev
```

5. Then we start a local development server. The console will display a local URL (e.g. <http://localhost:8081/>) where you can view the website in your browser.

BackEnd Setting

Prerequisites

1. **Install Docker Desktop:** Ensure that Docker Desktop is installed and running on your machine. You can download Docker Desktop from [Docker's official website](#).

Steps for Deployment

1. **Pull the Docker Image:** Open your terminal and run the following command to pull the latest Docker image for the backend:

```
1 docker pull rita6667/gemini-app:latest
```

2. **// set up DataBase**

3. **Run the Backend Code:** Once the Docker image has been pulled successfully and the Database has been deployed, you can run the backend code by executing the `ParsonsApp` under UserDatabase files. This app will initialize the backend services.



Meeting Minutes

i All important meeting notes are kept in pages under Meeting Minutes

Decisions making from meetings

Page Title	Decisions
Sprint 1 Product Review Meeting 2	<ul style="list-style-type: none">👉 UI blocks: Add indentation before blocks; unify the color of blocks.👉 Changes to be made in the feedback section.
Sprint 1 Reflection	<ul style="list-style-type: none">👉 Keep a decision backlog for Sprint 2 and 3
Week 10 Scrum Meeting Notes	<ul style="list-style-type: none">👉 Check correctness of generated code into the docker IDE for runtime checking.👉 Add 'Completeness' to each context.👉 Add 'Hint' in question page.
Week 10 Work Allocation Meeting	<ul style="list-style-type: none">👉 Demonstrate the functionalities of product through video and voiceover.
Week 11 Scrum Meeting	<ul style="list-style-type: none">👉 Remove completeness bar.👉 Focus on product testing, both automated and manual.👉 Show product Live Demo in presentation.
Week 13 Scrum Meeting	<ul style="list-style-type: none">👉 Deploy the product on server to show client.
Week 2 Scrum Meeting Notes	<ul style="list-style-type: none">👉 Scrum roles👉 Work allocation
Week 3 Client Meeting	<ul style="list-style-type: none">👉 No user sign in required.👉 Implement only Boolean feedback for now.👉 Use free AI models
Week 3 Scrum Meeting Notes	<ul style="list-style-type: none">👉 Start transferring UI design to front end code.👉 Use Gemini AI model👉 Start developing AI interface to the backend

	 Create Database
 Week 4 Work Allocation Notes	 Draw diagrams and write documents to help better understand of the product
 Week 5 Scrum Meeting Notes	 Each topic should include several contexts.  Aim to finish the sprint by 26/08/2024.  No cookies needed.
 Week 6 Client Meeting	 Refine Feedback section  No library resources needed for the person's problems.
 Week 8 Scrum Meeting	 Change IP Address to randomly generated IDs in the Admin->Dashboard page.
 Week 8 Scrum Meeting 2	 AI and IDE are developed as independent projects packaged into JAR files, then use database to manage the JARs.
 Week 9 Client Meeting	 Generate CSV files for CSV Read/Write topic only; let the backend store the generated CSV file.  Include warnings in the IDE feedback.
 Week 9 Scrum Meeting	 Indent the code block by clicking on the block.

All meeting notes

Title	Creator	Modified
Week 13 Scrum Meeting	Yiru Liu	Oct 26, 2024
Week 11 Work Allocation Meeting	Yiru Liu	Oct 22, 2024
Week 10 Scrum Meeting Notes	Yiru Liu	Oct 22, 2024
Week 11 Scrum Meeting	Jiayi Wang	Oct 22, 2024
Week 12 Scrum Meeting	Yiru Liu	Oct 22, 2024
Week 11 Group Practice of Presentation	Yiru Liu	Oct 22, 2024
Week 10 Work Allocation Meeting	Yiru Liu	Oct 22, 2024
Week 9 Client Meeting	Yiru Liu	Sep 25, 2024
Week 8 Scrum Meeting 2	Yiru Liu	Sep 22, 2024
Sprint 1 Reflection	Yiru Liu	Sep 22, 2024
Sprint 1 Product Review Meeting 2	Yiru Liu	Sep 22, 2024
Week 9 Scrum Meeting	Yiru Liu	Sep 22, 2024

Week 8 Scrum Meeting	Yiru Liu	Sep 18, 2024
Week 7 Scrum Meeting Notes	Yiru Liu	Sep 09, 2024
Week 6 Client Meeting	Yiru Liu	Aug 31, 2024
Week 5 Work Allocation Notes	Yiru Liu	Aug 31, 2024
Week 4 Work Allocation Notes	Yiru Liu	Aug 31, 2024
Week 5 Scrum Meeting Notes	Yiru Liu	Aug 31, 2024
Week 3 Scrum Meeting Notes	Yiru Liu	Aug 31, 2024
Week 2 Scrum Meeting Notes	Yan Gong	Aug 31, 2024

[Find more results](#)

1 Sprint 1 Meeting Notes

 This is the cover page of the Sprint 1 Meeting Record folder. Please see files within the folder for detailed meeting records.

Week 2 Scrum Meeting Notes

 Date

Aug 1, 2024

Participants

@Yan Gong @Jiayi Wang @Howard Li @Yifan ZHANG @Yiru Liu

Goals

Discuss the requirements of the current project; allocate Sprint 1 works to each team member.

Discussion topics

Item	Notes
Scrum Roles	<p><i>Scrum Master:</i> Howard Li</p> <p><i>Product Owner:</i> Yiru (Sarah) Liu</p> <p><i>Development Team:</i> Jiayi (Ivy) Wang; Yan (Rita) Gong; Yiru Liu; Howard Li; Yifan Zhang</p>
Requirement Discussion	<p><i>Understanding Geela's need</i> based on the first meeting:</p> <ul style="list-style-type: none"> Parson's problem questions are AI generated questions whose content are COMP20008 specific - including linear regression, correlation, machine learning and so on. We need to check the correctness of the generated questions before applying them in the actual website. Users are COMP20008 students. The User Interface (UI) needs to be easy to use. Users are able to customize questions by selecting the modules of topics they are interested in. User should be able to receive feedback every time, where feedback includes IDE feedback and time spent.
	<p>Questions about requirements: (ask Geela in person in next week's workshop)</p> <ol style="list-style-type: none"> Is there any budget on ChatGPT API? Do we need to have a build-in online compiler for IDE style feedback? Should we generate a complete code or it can be a third party library such as sklearn to import from it? Example:
	<pre> 1 # Locate the most similar neighbors 2 def get_neighbours(train, test_row, n_neighbors): 3 distances = [] 4 for train_row in train: 5 dist = euclidean_distance(test_row, train_row) 6 distances.append((train_row, dist)) 7 distances.sort(key=lambda tup: tup[1]) 8 neighbors = [] 9 for i in range(n_neighbors): 10 neighbors.append(distances[i][0]) 11 return neighbors </pre>
	<pre> 4 # calculate the Euclidean distance between two vectors 5 def euclidean_distance(row1, row2): 6 distance = 0.0 7 for i in range(len(row1)-1): 8 distance += (row1[i] - row2[i])**2 9 return sqrt(distance) 10 </pre> <pre> from sklearn.neighbors import KNeighborsClassifier data = list(zip(x, y)) knn = KNeighborsClassifier(n_neighbors=1) knn.fit(data, classes) </pre>
	<ol style="list-style-type: none"> Does the product contain sign in function? Do we need to also design mobile phone compatible UI? Does the product have hint of each problem? Is there any administration account?
Project Breakdown	<p>After brain storming and discussing, we have agreed that the project is generally composed by 3 main parts: UI design, AI problem generation and interface for parsons problems.</p>
Sprint 1 Work Division	<p>We have divided the 3 main parts into more specific jobs and assigned them to each team member, so that we can start working on different field that we are</p>

more confident with, and collaborate. Below is a list of roles for each development team member:

Ivy: UI design using Figma

Rita: Investigation on different AI models and writing prompts; write user story

Sarah: Take meeting notes; learn Figma

Howard: Create interface between database and backend

Yifan: Create database

Action items

- Investigate into project requirements
- Scrum roles allocation
- UI design
- Database creation
- Writing up documents

Decisions

 Scrum roles

 Work allocation

Week 3 Scrum Meeting Notes

Date

Aug 11, 2024

Participants

- @Yifan ZHANG @Yan Gong @Jiayi Wang **@Yiru Liu** @Howard Li

Goals

- Check the progress of work which was assigned on 1st August
- Address any ambiguous parts of requirements

Discussion topics

Item	Presenter	Notes
UI Design	Jiayi Wang	Design website prototype using Figma.  Parsons Problem
Database Initialization	Yifan Zhang	
Connect Database to Backend	Howard Li	We are able to connect the database to Java backend.
Next Step	Howard Li	The next step of our sprint 1 is to transfer design to frontend code. Meanwhile, the development of API interface to the backend can be done simultaneously.
State Machine	Yan Gong	Discuss the functionality of our product by drawing a state machine diagram.
AI Model	Yan Gong	Test on different AI models, including Chat GPT, Llama and Gemini. Result: Gemini is free and relevantly more efficient to use.
Question1	Yiru Liu	We had a disagreement about how user 'customize questions' works. While two of us thought the customization means the product has to contain an AI chatbot so that user can send their own thoughts on question styles to the chatbot, the rest of us thought customization simply means making different choices of modules of 7 predefined topics.
Question 2	All	How specific will the data analysis be - does it have to contain analytics on every question, or analytics on each topic?

Action items

- Ask questions from Rina in workshop.

⌚ Decisions

👉 Start transferring UI design to front end code.

👉 Use Gemini AI model

👉 Start developing AI interface to the backend

👉 Create Database

Week 4 Workshop notes

Date

Aug 12, 2024

Participants

003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Rina Zhang @Yan Gong @Yifan ZHANG)

Goals

- Address questions

Q & A

Question	Answer
Does 'user customization' mean the product has to contain an AI chatbot so that user can send their own thoughts on question styles to the chatbot, or it simply indicates that users can customize their problems by choosing one of the 7 modules of predefined topics?	We need to create modules each containing a predefined topic, so that user can choose their interested topic of problems.
How specific will the data analysis be - does it have to contain analytics on every question, or analytics on each topic?	There will be analytics on each topic.

Week 4 Work Allocation Notes

📅 Date

Aug 13, 2024

👥 Participants

@Yiru Liu @Jiayi Wang @Yan Gong @Howard Li @Yifan ZHANG

📝 Goals

- Finish writing documents
- Draw all relevant diagrams

🗣️ Discussion topics

Item	Assignee
Polish user story	Yan Gong
Draw state machine diagram	Yan Gong
Draw use case diagram	Yifan Zhang
Draw domain model diagram	Yifan Zhang
Draw motivation model	Jiayi Wang
Draw architecture design model	Jiayi Wang
Polish requirement document	Howard Li
Draw sequential diagram	Howard Li
Summarize all meeting notes	Yiru Liu
Write required documents on Confluence	Yiru Liu

⌚ Decisions

👉 Draw diagrams and write documents to help better understand of the product

Week 5 Scrum Meeting Notes

Date

Aug 19, 2024

Participants

003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Rina Zhang @Yan Gong @Yifan ZHANG)

Goals

- Continue working on sprint 1 tasks
- Finish implementing the new requirement - adding contexts.

Discussion topics

Item	Note
Discuss any unfinished tasks	Continue on UI design @Jiayi Wang and finish writing relevant frontend code @Howard Li @Yifan ZHANG .
Adding context to topics	The new requirement from Geela - add several engaging, simple and interesting contexts to each topic. The contexts should be predefined @Yiru Liu , while the scenario and story should be AI generated @Yan Gong .
Cookies for recording question history	Geela has suggested that there could be a cookie for recording the question history. However, we came up with the decision that cookies are unnecessary for our product (at least unnecessary for the current sprint), since there is a database recording all the processes for students.
Ai generated questions	Write prompt about topic and related context and make ai to generate scenario and questions, then return the question back to ai and let ai generate code, instead of making the ai generate both questions & codes together.

Action items

- Record product backlog.
- Continue on UI design.
- Refine AI prompt on generating scenarios for different contexts.
- Basic implementations of UI to frontend code.

Decisions

 Each topic should include several contexts.

 Aim to finish the sprint by 26/08/2024.

 No cookies needed.

Week 5 Work Allocation Notes

📅 Date

Aug 21, 2024

👥 Participants

@Jiayi Wang @Yan Gong @Yifan ZHANG @Howard Li @Yiru Liu

📋 Goals

Preparation for presentation on 2024-08-26.

🗣 Presentation topics

Item	Presenter	Notes
Introduction	@Yiru Liu	Introduce team 003 - team name, scrum roles, progress in the sprint 1
UI design	@Jiayi Wang	Present UI design
AI generation	@Yan Gong	Introduce AI model used, how the ai generation works & show predefined contexts to client.
Front End	@Howard Li	Presentation on what functionality our product has implemented.
Database	@Yifan ZHANG	Show the database and explain what it does.

✓ Action items

- Each team member should prepare around 2 minutes' presentation.

2 Sprint 2 Meeting Notes

 This is the cover page of the Sprint 2 Meeting Record folder. Please see files within the folder for detailed meeting records.

Week 7 Scrum Meeting Notes

📅 Date

Sep 2, 2024

👤 Participants

@Yiru Liu @Yifan ZHANG @Howard Li @Yan Gong @Jiayi Wang

📝 Goals

- Discuss Sprint 2 goals
- Allocate works to each development team member

👤 Work Allocation

Assignee	Item	Notes
Yifan Zhang	https://student-team-zjyi1h63.atlassian.net/t/browse/D003-21 Can't find link	
Yan Gong	https://student-team-zjyi1h63.atlassian.net/t/browse/D003-22 Can't find link	<ul style="list-style-type: none">• Refine AI prompts• Limit the length of code
Howard Li	https://student-team-zjyi1h63.atlassian.net/t/browse/D003-23 Can't find link	
Jiayi Wang	https://student-team-zjyi1h63.atlassian.net/t/browse/D003-24 Can't find link	
Yiru Liu	https://student-team-zjyi1h63.atlassian.net/t/browse/D003-25 Can't find link	
Jiayi Wang	https://student-team-zjyi1h63.atlassian.net/t/browse/D003-26 Can't find link	<ul style="list-style-type: none">• Change the arrangement of question page• Correct the indentation of code blocks• Unify the color of blocks

Week 8 Scrum Meeting

Date

Sep 9, 2024

Participants

003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Rina Zhang @Yan Gong @Yifan ZHANG)

Goals

- Discuss topics to present to client next week
- Address any issues

Discussion topics

Item	Notes
Presentation	<ul style="list-style-type: none">• Primary focus is to show demo to client• Present UI prototype• For demonstrating how well the AI generation works, present the client with a real-time AI problem generation.• Introduce additional functions provided by the database.
Exposing IP addresses of users to administrator will yield a security problem.	Solution: Either change the IP addresses to nicknames picked by users, or let our product generate random IDs for users to cover their IP addresses.

Action items

- Prepare for client meeting.

Decisions

 Change IP Address to randomly generated IDs in the Admin->Dashboard page.

Week 8 Scrum Meeting 2

Date

Sep 13, 2024

Participants

@Jiayi Wang @Yan Gong @Howard Li @Yifan ZHANG @Yiru Liu

Goals

- Regular catch up
- Discuss any difficulties and how they can be solved

Progress Update

Item	Presenter	Notes
Database Update	Yifan Zhang	<ul style="list-style-type: none">• Predefined topics and contexts are stored in the database which can be obtained by backend code. This makes easier future extensions on topics and contexts.• Implement filter function – allowing administrator to select to view statistics under desired topic(s).• Encrypt IP addresses by random alphabetical letters.
UI prototype update	Jiayi Wang	<ol style="list-style-type: none">1. Answer Page: (major changes, according to client's feedback)<ul style="list-style-type: none">• A loading page for awaiting questions from AI• For the sake of bigger space for answer:<ul style="list-style-type: none">◦ Read scenario and question before initiating the Parsons Problem◦ Scenario and question is hidden when start taking the problem, which can be viewed again by clicking 'Show Problem'• Foldable IDE-styled real-time look of the code – again, for the purpose of larger answer area• Unifies color of blocks• Indentation in the answer box2. Feedback:<ul style="list-style-type: none">• Remove 'Accuracy' analysis• Add 'Timer' and 'Number of Attempts'
UI Prototype Homepage update	Yiru Liu	Add general introduction of the product and introduction of functions.

Connection between frontend and backend: Implemented functionalities	Howard Li	<p>1. Website Pages Overview:</p> <ul style="list-style-type: none"> Homepage: <p>Click 'Start' to start taking questions</p> <p>Click 'Learn more' to explore more introduction</p> <ul style="list-style-type: none"> Topic Page: <p>A list of predefined data-processing topics</p> <ul style="list-style-type: none"> Context Page: <p>Available after selecting a topic</p> <p>A range of interesting predefined contexts</p> <ul style="list-style-type: none"> Question Page: <p>Allow users to do personalised Parsons Problems that are generated by AI</p> <ul style="list-style-type: none"> Admin - Dashboard: <p>Administrator enters the password, log themself in, to view the data analytics.</p> <p>2. Product Features</p> <ul style="list-style-type: none"> AI generated questions: Connected to Gemini API, our product provides user with a huge range of personalized questions to take or regenerate at any time. IDE-styled feedback: Users can receive instant IDE-styled feedback to get a professional review of the correctness. Administrative statistics: Administrator can obtain up-to-date statistical information on students' performance in each topic. Privacy matters: Each IP address is assigned to a random ID. Only the ID is viewable as the user's information in the Dashboard.
IDE feedback	Yan Gong	Implement Python IDE functionalities so that users will receive IDE-styled feedback of their answers.

❓ Challenges and Questions

Problem	Presenter	Notes
AI, Database & IDE connections	Howard Li	The challenge is: how to connect AI, Database and IDE to backend separately in order to follow a High Cohesion and Low Coupling design.

Prompts for CSV related problems	Yan Gong	When reading CSV files, an error would occur if there is no actual CSV file for IDE to load in the current path. The challenge is, putting a CSV file in the code of each AI generated question is unrealistic, since the CSV file could be too long; otherwise, is it a good practice to keep a constant CSV file for all CSV related questions for the IDE to load? (We need to seek for client's opinion for this question.)
IDE Warnings	Yan Gong	<p>Even through the user's answer is correct, sometime IDE will still have warnings like the following:</p> <pre>FutureWarning: 'squared' is deprecated in version 1.4 and will be removed in 1.6. To calculate the root mean squared error, use the function'root_mean_squared_error'. warnings.warn()</pre> <p>Our concern is that, while the user gives correct answer, the warnings can be confusing. Do we still need to provide the warning to the users even though they have done the question correctly?</p>

✓ Action items

- Ask questions above to clients

⌚ Decisions

👉 AI and IDE are developed as independent projects packaged into JAR files, then use database to manage the JARs.

Week 9 Scrum Meeting

Date

Sep 18, 2024

Participants

@Yiru Liu @Jiayi Wang @Yan Gong @Howard Li @Yifan ZHANG

Goals

- Discuss any challenges
- Finish up this sprint

Discussion topics

Item	Presenter	Notes
Challenge: Implementing Indentation Function	Howard Li	<p>Howard has been attempting two ways of implementing the indentation in the 'Drop blocks here' area of the answer page. The two attempts of implementation are described as the following:</p> <ol style="list-style-type: none">1. In the 'Drop blocks here' area, use the mouse to drag the code blocks to the right to make the indentation. While this follows the original design, there are problems in this implementation: only up to 4th indentation can be made, any further dragging to the right will cause no effect. Also, intuitively, the changes in indentation should be able to be undone by dragging the code to the left. However, this undoing function cannot be implemented, whereas the only way to undo the indentation is to return the block back into the 'Drag from here' area.2. In the 'Drop blocks here' area, make the code indented by clicking on the code. There are at most 4 levels of indentations allowed. Clicking the code for the 5th time will make it return to the original point with no indentation. <p>Justification: While attempt 1 fits our design of dragging the code to make indentation, the other parts are anti-intuitive and inconvenient to use. The attempt 2 is comparatively more convenient to use. Therefore, we will keep the 2nd way to implement the indentation function.</p>
Product Testing	Jiayi Wang	<p>We have completed most of the functionalities as described in user stories. Therefore, it's crucial for our product to do some testings before deployment. The roles of testing different aspects of our website are assigned as following:</p> <p>Yifan: D003-33: PT01 - Database Testing DONE</p> <p>Yan: D003-34: PT02 - AI generation testing DONE</p> <p>Howard: D003-35: PT03 - IDE testing DONE</p>

Action items

Product Testings

Decisions

 Indent the code block by clicking on the block.

3 Sprint 3 Meeting Notes

i This is the cover page of the Sprint 3 Meeting Record folder. Please see files within the folder for detailed meeting records.

[!\[\]\(c386b6be28f29f50a8089f4302e31f17_img.jpg\) Week 10 Scrum Meeting Notes](#)

[!\[\]\(bc2f4b82063361d21f421857ea198789_img.jpg\) Week 10 Work Allocation Meeting](#)

[!\[\]\(f44d6154fb700fb72b613123de1343f7_img.jpg\) Week 11 Scrum Meeting](#)

[!\[\]\(121c996de73948f037b88126d1f67074_img.jpg\) Week 11 Work Allocation Meeting](#)

[!\[\]\(c5766131ceb9a350adcd604a1b121801_img.jpg\) Week 11 Group Practice of Presentation](#)

[!\[\]\(697a5b201a55a2a758f47806b9931892_img.jpg\) Week 12 Scrum Meeting](#)

[!\[\]\(fa46275bbfd247d70efa9c8b079ba519_img.jpg\) Week 13 Scrum Meeting](#)

Week 10 Scrum Meeting Notes

Date

Sep 30, 2024

Participants

003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Rina Zhang @Yan Gong @Yifan ZHANG)

Goals

- Assign roles for Sprint 3
- Come up with questions related to product requirements

Roles Assignments

Assignee	Item	Details
@Howard Li	Full stack development	<p>Backend:</p> <ul style="list-style-type: none">• Check the correctness of generated code <p>Frontend:</p> <ul style="list-style-type: none">• Add a 'Hint' area where users can choose to view or hide hints via a button• Add 'Filter' function to the dashboard• Refine Admin Login: solve the problem of becoming logged out after refreshing.• Refine Feedback Page: Clearer user interaction and tutorial• Topic: Add function of modifying difficulty for each topic.• Add a 'Tutorial' button that allow user to view the guide of using the product.
@Yifan ZHANG	Continue working on database refinement	<ul style="list-style-type: none">• Create a backend interface for database• Implement filtering function in the database, so that admin can view different charts that are filtered by topics• Record the level of completeness
@Yan Gong	Refine AI prompt	<ul style="list-style-type: none">• Tell AI to generate hint• Check the relevance pf generate questions• Record the completeness of each context (how many out of 40)
@Jiayi Wang	Refine UI	<ul style="list-style-type: none">• Refine dashboard, hint, tutorial, topic and context sections based on the discriptions above.
@Yiru Liu	Presentation Setup	<ul style="list-style-type: none">• Design PowerPoint• Determine the contents of presentation
@Jiayi Wang	Presentation Design	<ul style="list-style-type: none">• Think of interesting ways to present the product

003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Yan Gong @Yifan ZHANG)	Write Presentation Scripts	
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❓ Questions

Item	Presenter	Notes
AI Model	@Yan Gong	<ul style="list-style-type: none"> • Do we need to switch our current AI model (ie. Gemini) to a more advanced model (ie. ChatGPT charged version) • If we do need to change to a charged AI model, what would be the budget • Is there any limit to the students on the times that student can generate questions

✓ Action items

- Ask questions to Rina

⌚ Decisions

👉 Check correctness of generated code into the docker IDE for runtime checking.

👉 Add 'Completeness' to each context.

👉 Add 'Hint' in question page.

Week 10 Work Allocation Meeting

Date

Oct 5, 2024

Participants

003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Yan Gong @Yifan ZHANG)

Goals

- Focus on designing the structure and content of the presentation.
- Briefly catch up on the progress of development of product.

Discussion topics

Item	Notes
Interesting Opening & Introduction	One presenter will act as a 'clueless' EODP student and talk about issues facing when studying EODP; another presenter will act as a CodeCraft product promoter and introduce the product features that would help him studying EODP.
(Draft Version) Presentation Structure	Part1. Funny introduction Part2. Product Demo Video Part3. Introductions of each individual's technical contribution Part4. Proud moments; challenges; lessons; tools; etc.

Action items

- Start writing scripts related to technical contributions.

Decisions

 Demonstrate the functionalities of product through video and voiceover.

Week 11 Scrum Meeting

Date

Oct 7, 2024

Participants

003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Rina Zhang @Yan Gong @Yifan ZHANG)

Goals

- Continue to show our current results to the supervisor in workshop, and determine with Rina if the current functionality is complete.
- Check if the product needs to be deployed
- Determine with Rina the current flow of the presentation and get feedback from Rina.
- Show PowerPoint prototype to Rina and seek for her advice.
- Allocate presentation-related tasks.

Discussion topics

Item	Notes
Current Status Feedback	Feedback From Rina: <ul style="list-style-type: none">• There are no other issues with the current product, except that the star rating and Completion progress bar are not very MAKING SENSE, and suggested reconfirming with the Client if the progress bar is necessary.
Presentation Structure Feedback	<ul style="list-style-type: none">• Ideas of making the presentation 'entertaining' are well-formed.• Need change: Show product live demo instead of recorded video.
Adjusting Difficulty	<ul style="list-style-type: none">• This function could be neglected.
Presentation Content	The presentation contents have been determined following the marking rubrics. <ul style="list-style-type: none">• Funny introduction• Requirements(functional and non functional)• Live demo(functionality details)• Team info• Technologies• Collaborative tools• Key challenges• Proud of something• Main learned from this subject• Acknowledgement Duration of each section is to be determined.

Assignee	Notes
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@Yiru Liu	Refine the PowerPoint slides.
003 - Deadline Dominators (@Yiru Liu) @Howard Li @Jiayi Wang @Yan Gong @Yifan ZHANG)	Write scripts that related to your introducing your focused tasks. For example, Jiayi should focus on talking about the UI design, and Yan should emphasize on showing the AI generation.

✓ Action items

- Continue working on product refinement, especially testing.
- Continue to prepare for presentation.

⌚ Decisions

-  Remove completeness bar.
-  Focus on product testing, both automated and manual.
-  Show product Live Demo in presentation.

Week 11 Work Allocation Meeting

Date

Oct 9, 2024

Participants

003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Yan Gong @Yifan ZHANG)

Goals

- Regular catch-ups of scrum works.
- Assign presentation parts evenly to each developer.

Product Catch-Up

Item	Presenter	Notes
Frontend Update & Issue	Howard Li	<p>1. Completeness bar and difficulty rating have been removed.</p> <p>2. <i>Issue:</i> Each new entry of the localhost will have the problem that the question and scenario cannot be displayed, while the code can be displayed properly. <i>Solution:</i> Update the backend checking logic - if the question and scenario are not displayed, let the AI to regenerate a question.</p>

Presentation Parts Assignment

Content	Assignee/ Presenter	Note
Funny Opening	Yiru Liu & Yifan Zhang	Make an entertaining opening
Product Overview	Yiru	Briefly introduce the key features of our product CodeCraft.
Team Scrum Roles & Structure	Yiru	Introduction on team structure and each developer's focused areas.
Requirements	Jiayi Wang	Introduce both functional and non-functional requirements.
UI Design	Jiayi	Demonstrate the key features of UI design.
Live Demo - User Generic Features	Howard Li	Show product functionalities such as generate question, rearrange code snippets, make indentation, check IDE-feedback, etc.
Live Demo - Admin Specific Features	Yifan	Show admin dashboard functionalities, such as data

		analytics and admin log in.
AI Generation	Yan Gong	Introduce AI generation by the following aspects: Unique feature; Dynamic problem generation; Code solution and practical training.
Technologies	Yan	A brief overview of technologies we used and why we choose to use them.
Communication Tools	Yifan	
Challenges	Yifan	Present the 3 key challenges we have faced: Backend Integration and API Design; Defining Clear requirements; Team Internal Communication Tool.
Proud Moments	Jiayi	Effective Decision Making; Delivering a User-Centered Solution; Teamwork and Collaboration.
Lessons Learned	Yiru	Following Agile Ceremonies; Developing the product in an agile & iterative manner with testing; Team Collaboration; Insights to work experience.

✓ Action items

- Complete scripts and practice at home.

Week 11 Group Practice of Presentation

Date

Oct 12, 2024

Participants

003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Yan Gong @Yifan ZHANG)

Goals

- Practice the presentation several times and find possible defects to ensure a good timing and fluent flow.

Presentation Timing

Content	Assignee/ Presenter	Timing
Funny Opening	Yiru Liu & Yifan Zhang	30s
Product Overview	Yiru	45s
Team Scrum Roles & Structure	Yiru	30s
Requirements	Jiayi Wang	1min
UI Design	Jiayi	2min
Live Demo - User Generic Features	Howard Li	3.5min
Live Demo - Admin Specific Features	Yifan	1.5min
AI Generation	Yan Gong	2min
Technologies	Yan	30s
Communication Tools	Yifan	30s
Challenges	Yifan	1min
Proud Moments	Jiayi	30s
Lessons Learned	Yiru	30s
Acknowledgement	Yiru	10s

Action items

- Continue to practice presentation.

Week 12 Scrum Meeting

Date

Oct 21, 2024

Participants

003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Yan Gong @Yifan ZHANG)

Goals

- Weekly catch-up.
- Continue on doing product testing.
- Discuss product security & ethics.

Discussion topics

Item	Assignee	Notes
Product Testing	Jiayi Wang Yan Gong Yifan Zhang	There are three main aspects of product testing: 1. Database 2. AI Generation 3. Frontend - testing each page
Product Testing Report	Yiru Liu	Summarize the testing results.
Frontend Refinement	Howard Li	Continue working on product refinement, including fixing the issue that the generated code snippets will have a little bit overlap with the IDE-feedback region.
Security Report	Jiayi Wang	<ul style="list-style-type: none">• Admin Login.• IP addresses hiding.• Impacts of inserting inappropriate data.
Ethics Report	Yiru Liu	<ul style="list-style-type: none">• AI-Generated content accuracy.• Equity in access and customization.• Data privacy and anonymity.

Action items

- Continue on product testing.
- Write Security and Ethics reports.

Week 13 Scrum Meeting

Date

Oct 26, 2024

Participants

003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Yan Gong @Yifan ZHANG)

Goals

- Finalize the product
- In order to present the final product to client, we need to deploy the product on server. See [Final Product - Deployment](#) for decision log.

Role Assignment

Item	Assignee
Deployment - Full Stack	Yifan Zhang
Deployment - Docker	Yan Gong

Action items

Complete the deployment on server before Nov 1, 2024

Decisions

 Deploy the product on server to show client.



Product Backlog

Product Backlog

i Yellow, purple and pink shadings represent that the user story is implemented in Sprint 1, Sprint 2 and Sprint 3 respectively.

ID	As a	I want to	So that	Priority	Story Points	Status
1	User	select a topic that I want to learn.	improve knowledge in specific area.	High	5	COMPLETED in sprint 1
2	User	select a specific context that I want to learn.	I can learn specific knowledge	High	8	COMPLETED in sprint 1
3	User	have the choice to re-generate code.	I can skip something that I don't want to learn or I have already learned.	High	4	COMPLETED in sprint 1
4	User	know whether my answer is correct or not	I can try to fix my answer as soon as possible	High	5	COMPLETED in sprint 1
5	User	get feedback of IDE as soon as I submit my code.	I can understand my mistakes and improve it.	Medium	14	COMPLETED in sprint 2
6	User	be able to use the platform anonymously	protect my privacy	High	4	COMPLETED in sprint 1
7	User	see a summary report showing my progress and performance	I can understand my strengths and weaknesses	High	6	COMPLETED in sprint 1
8	User	see the description of question and corresponding code	I can know what type of problem the code solves.	High	5	COMPLETED in sprint 1
9	User	expand or hide the description of question at any time	there could be more spaces for me to do the question	Medium	8	COMPLETED in sprint 2
10	User	be able to see the hint to a particular question	I can get some help when I find myself stuck.	Medium	5	COMPLETED in sprint 3

11	User	get questions generated by the LLM model to be consistent in quality, relevance, and difficulty level	ensure a fair and balanced assessment or interaction experience.	High	10	COMPLETED in sprint 1
12	User	get code generated by the LLM model to be correct and functional based on the questions generated previously.	ensuring that the output is reliable and accurate for use in real-world applications.	High	8	COMPLETED in sprint 3
13	User	get each code block indented by clicking on the block	I can get to practice Python Indentation.	Medium	10	COMPLETED in sprint 2
14	User	not show my IP addresses to administrators	I can protect my privacy.	Medium	5	COMPLETED in sprint 2
15	Admin	have all the functions that student account have	I can know the scope of knowledge that students can acquire through experimentation.	High	1	COMPLETED in sprint 1
16	Admin	a summary of the anonymous forms of student response performance	I can know which topic that students are lacking in.	High	8	COMPLETED in sprint 2
17	Admin	login in based on the predefined admin key	I can access to the system with higher privileges.	High	5	COMPLETED in sprint 2



Sprint Planning



Sprint 1: 01/08/2024 - 30/08/2024

1 Sprint 1 Planning

- Sprint planning checklist
- Sprint team members
- Sprint planning meeting items
 - Sprint Backlog
 - Capacity planning
 - Team Specializations
 - Potential risks
- Product Review Meeting
- Sprint Retrospective
- Sprint Reflection

Sprint planning checklist

Date And Duration	Preparation	Meeting	Follow up
01-08-2024 One hour	All team members should read consider the product requirements carefully.	Discussion of what scrum role each team member is interested to take. Week 2 Scrum Meeting Notes	<input checked="" type="checkbox"/> Decide Scrum Roles
01-08-2024 One hour	Think about what could be the first-stage task to initialize developing the product.	Assign first-stage tasks to team members, including: <ul style="list-style-type: none">• Write requirement documents• Create Database• Design User Interface (UI)• Discuss font design and answer page design Week 2 Scrum Meeting Notes	<input checked="" type="checkbox"/> D003-1: write requirement document DONE <input checked="" type="checkbox"/> D003-2: create database DONE <input checked="" type="checkbox"/> D003-3: UI design DONE <input checked="" type="checkbox"/> D003-4: Discuss font design, answer page design DONE
11-08-2024 2 hours	<ul style="list-style-type: none">• Confirm the task list.• Think about what to do next. (e.g. any diagrams or documents to aid introducing the product?)	<ul style="list-style-type: none">• Check the progress of works assigned on 01-08-2024.• Assign next step tasks to each team member. Week 3 Scrum Meeting Notes	<input checked="" type="checkbox"/> D003-11: Polish user stories and draw state machine of process DONE <input checked="" type="checkbox"/> D003-12: Draw the motivational model and architecture design diagram DONE <input checked="" type="checkbox"/> D003-13: Draw use case diagram and domain model diagram DONE <input checked="" type="checkbox"/> D003-14: Polish and write requirement document and draw sequential diagram DONE <input checked="" type="checkbox"/> D003-15: Summary and write all required documents DONE
19-08-2024 2 hours	<ul style="list-style-type: none">• Record current product backlogs	Discuss any unfinished tasks of sprint 1, and assign unfinished task. Aim to finish all tasks before the team presentation on 26-08-2024.	<input checked="" type="checkbox"/> D003-17: AI generated questions DONE <input checked="" type="checkbox"/> D003-18: Define Contexts DONE <input checked="" type="checkbox"/> D003-19: frontend to backend initialisation DONE <input checked="" type="checkbox"/> D003-20: frontend vue component creation for question demo DONE

👤 Sprint team members

Name	Role
@Howard Li	Scrum Master & Development Team
@Yifan ZHANG	Development Team
@Yan Gong	Development Team
@Jiayi Wang	Development Team
@Yiru Liu	Product Owner & Development Team

📝 Sprint planning meeting items

Sprint Backlog

[📋 Sprint 1 Backlog](#)

Capacity planning

Current sprint	
Total days	4 weeks
Team capacity	90%
Projected capacity	60 points
Individual capacity	<p>@Howard Li : 14</p> <p>@Yan Gong : 12</p> <p>@Jiayi Wang : 14</p> <p>@Yifan ZHANG : 10</p> <p>@Yiru Liu : 10</p>

Team Specializations

Team Member	Specializations
@Howard Li	Backend & frontend coding
@Yan Gong	AI Prompt
@Jiayi Wang	UI design
@Yifan ZHANG	Database

Potential risks

Risk	Mitigation
The team may have time constraints	Focus on the high priority tasks first.

👩‍💻 Product Review Meeting

[📝 Sprint 1 Product Review Meeting 1](#)

[📝 Sprint 1 Product Review Meeting 2](#)

🧠 Sprint Retrospective

[📝 Sprint 1 Retrospective Meeting](#)

🤔 Sprint Reflection

[📝 Sprint 1 Reflection](#)

Sprint 1 Backlog

As a	I want to	So that	Priority	Story Points
User	select a topic that I want to learn.	improve knowledge in specific area.	High	5
User	select a specific context that I want to learn.	I can learn specific knowledge	High	8
User	have the choice to regenerate code.	I can skip something that I don't want to learn or I have already learned.	High	4
User	know whether my answer is correct or not	I can try to fix my answer as soon as possible	High	5
User	see a summary report showing my progress and performance	I can understand my strengths and weaknesses.	High	6
User	be able to use the platform anonymously	protect my privacy	High	4
User	see the description of question and corresponding code	I can know what type of problem the code solves.	High	5
User	get questions generated by the LLM model to be consistent in quality, relevance, and difficulty level	ensure a fair and balanced assessment or interaction experience.	High	10
Admin	have all the functions that student account have	I can know the scope of knowledge that students can acquire through experimentation.	High	1

2 Sprint 2 Planning

- Sprint planning checklist
- Sprint team members
- Sprint planning meeting items
 - Agenda
 - Sprint Backlog
 - Previous sprint summary
 - Details
 - Capacity planning
 - Potential risks

Sprint planning checklist

Preparation	Meeting	Follow up
<p><input checked="" type="checkbox"/> Organize the backlogs and retrospectives to close sprint 1.</p> <p>Estimated length: 1.5 hours</p>	<p> Sprint 1 Retrospective Meeting</p> <p> g</p>	
<p><input checked="" type="checkbox"/> Discuss the Sprint 2 goals, then allocate Sprint 2 works to each development team member.</p> <p>Estimated length: 1 hour</p>	<p>A general work allocations (main categories of work) for sprint 2:</p> <p> Week 7 Scrum Meeting Notes</p>	<p><input checked="" type="checkbox"/> Finish the following by Sep 16, 2024</p> <p><input checked="" type="checkbox"/> D003-47: DB - Database Setup DONE</p> <p><input checked="" type="checkbox"/> D003-29: FE - Frontend:implement entire UI interface DONE</p> <p><input checked="" type="checkbox"/> D003-30: ConnectIDE DONE</p> <p><input checked="" type="checkbox"/> D003-32: UI - Improve UI Design DONE</p> <p>The detailed works are included as child issues.</p>
<p><input checked="" type="checkbox"/> Consider who should be presenting what item in the client meeting,</p> <p>Estimated length: 1 hour</p>	<p> Week 8 Scrum Meeting</p>	<p>Yiru: Overall introduction on the product's implemented functionalities in sprint 2.</p> <p>Howard: General intro of the demo.</p> <p>Jiayi: Introduce AI design.</p> <p>Yifan: New features of Database.</p> <p>Yan: Summarize and conclusion. Ask questions as specified in the meeting notes.</p>
<p><input checked="" type="checkbox"/> Let each group member show the progress of implemented functionalities.</p> <p>Estimated length: 1 hour</p>	<p> Week 8 Scrum Meeting 2</p>	Add detailed Jira issues according to the completed work.
<p><input checked="" type="checkbox"/> Weekly catchup</p>	<p> Week 9 Scrum Meeting</p>	Finish the below product testings:

- Discuss any challenges and how those can be solved/negotiated
- Product Testing

Estimated Length: 2 hours

- D003-41: PT - Product Testing DONE As described in child issues.

Finish up all confluence documentations for sprint 2:

- D003-42: CJ - Confluence and Jira Management DONE

A summary of implemented functionalities are recorded in the following sprint backlog:

[Sprint 2 Backlog](#)

👥 Sprint team members

Name	Role
@Howard Li	Scrum Master & Development Team
@Yifan ZHANG	Development Team
@Yan Gong	Development Team
@Jiayi Wang	Development Team
@Yiru Liu	Product Owner & Development Team

📝 Sprint planning meeting items

Agenda

1. Close Previous Sprint
2. Capacity Planning

Sprint Backlog

[Sprint 2 Backlog](#)

Previous sprint summary

Sprint theme	Product Prototype
Story points	60
Summary	Sprint 1 Backlog

Details

Start date	Sep 2, 2024
End date	Sep 25, 2024
Sprint theme	Implement IDE and Polish Product Further

Capacity planning

Current sprint		Previous sprint
Total days	24 Days	28 Days
Team capacity	90%	90%
Projected capacity	50 points	60 points
Individual capacity	@Howard Li : 15 @Yan Gong : 10 @Jiayi Wang : 9 @Yifan ZHANG : 8 @Yiru Liu : 8	@Howard Li : 14 @Yan Gong : 12 @Jiayi Wang : 14 @Yifan ZHANG : 10 @Yiru Liu : 10

Potential risks

Risk	Mitigation
Our team could have a smaller buffer than we expect.	Our team might need to move to low priority of work to the backlog.
Some of the proposed functionalities may be too hard to implement.	Discuss with the entire team to attempt for an alternative solution; then negotiate with the client to see if the alternative satisfies her expectations.
Some team member may experience prolonged working period or larger capacity than planned.	Product owner should be responsible of rearranging the workload and assign some of the sub-tasks to other development team members.

Sprint 2 Backlog

As a	I want to	So that	Priority	Story Points
User	get feedback of IDE as soon as I submit my code.	I can understand my mistakes and improve it.	Medium	14
User	get each code block indented by clicking on the block	I can get to practice Python Indentation.	Medium	
User	not show my IP addresses to administrators	I can protect my privacy.	Medium	5
User	expand or hide the description of question at any time	there could be more spaces for me to do the question	Medium	5
Admin	login in based on the predefined admin key	I can access to the system with higher privileges.	High	5
Admin	a summary of the anonymous forms of student response performance	I can know which topic that students are lacking in.	High	8

3 Sprint 3 Planning

- Sprint Meeting Planning and Summary
- Sprint team members
- Sprint planning meeting items
- Agenda
 - Previous sprint summary
 - Details
 - Capacity planning
 - Potential risks

Sprint Meeting Planning and Summary

Preparation	Meeting	Follow up
<input checked="" type="checkbox"/> Organize the backlog and retrospective to close sprint 2. Estimated length: 1 hour.	 Sprint 2 Retrospective Meeting  g	<input checked="" type="checkbox"/> Update Sprint 3 backlog and product backlog.
<input checked="" type="checkbox"/> Discuss sprint 3 goals and allocate scrum roles. Estimated length: 2 hours.	 Week 10 Scrum Meeting Note  S Summarize of Sprint 3 works: <ol style="list-style-type: none">1. Refine the product.2. Do adequate manual and automated tests.3. Prepare well for the week 12 presentation.	<input type="checkbox"/> Finish the issues (and their child issues) listed below, before the end of sprint. <input checked="" type="checkbox"/> D003-67: AI - AI Prompt Refinement TO DO <input checked="" type="checkbox"/> D003-68: DB - Database Refinement TO DO <input checked="" type="checkbox"/> D003-69: PP - Presentation Preparation TO DO <input checked="" type="checkbox"/> D003-86: FR - Frontend Refinement TO DO <input checked="" type="checkbox"/> D003-90: PT - Continuing Product Testing TO DO <input checked="" type="checkbox"/> D003-97: FR - Final Reports TO DO
<input checked="" type="checkbox"/> Think about the structure of presentation Estimated length: 2 hours.	 Week 10 Work Allocation Meeting  ting Key Takeaway: Introduce the product through recorded video with voiceover.	<input checked="" type="checkbox"/> Start writing scripts related to technical works throughout the project.
<input checked="" type="checkbox"/> Finish PowerPoint demo. <input checked="" type="checkbox"/> Prepare questions to ask to supervisor in workshop.	 Week 11 Scrum Meeting Key Takeaway: <ul style="list-style-type: none">• Use live demo to demonstrate the product, instead of pre-recorded videos.• Suggested to remove 'Completeness bar'.• Neglect the function of adjusting difficulty.	<input checked="" type="checkbox"/> Remove 'Completeness' bar. <input checked="" type="checkbox"/> Finalize presentation slides.

<p><input checked="" type="checkbox"/> Divide the presentation content equally to each developer. Estimated Length: 1.5 hours.</p>	<p> Week 11 Work Allocation Meeting</p>	<p><input checked="" type="checkbox"/> Continue working on practicing the presentation and product refinement.</p>
<p><input checked="" type="checkbox"/> Think of aspects of product testing. Estimated length: 2.5 hours.</p>	<p> Week 12 Scrum Meeting</p> <p>Key Takeaway: Product testing should be consisted of both manual and automated.</p>	<p><input type="checkbox"/> Continue on product testing. <input type="checkbox"/> Write Security and Ethics reports.</p>

Sprint team members

Name	Role
@Howard Li	Scrum Master & Development Team
@Yifan ZHANG	Development Team
@Yan Gong	Development Team
@Jiayi Wang	Development Team
@Yiru Liu	Product Owner & Development Team

Sprint planning meeting items

Agenda

1. Close Previous Sprint
2. Capacity Planning

Previous sprint summary

Sprint theme	Implementation of most functionalities
Story points	50 points
Summary	 Sprint 2 Product Review Meeting

Details

Start date	Sep 30, 2024
End date	Oct 28, 2024
Sprint theme	Product Refinements With Adequate Testing & Final Presentation

Capacity planning

Current sprint		Previous sprint
Total days	29 days	28 days

Team capacity	70%	90%
Projected points	For Story Points: 13 For Testing: AI Generation: 5 points Frontend Testing: 10 Points Database Testing: 5 points	60 Story Points

Potential risks

Risk	Mitigation
Large scale of manual testing.	Try to transfer some manual testing to automated.
Some of the proposed functionalities may not be part of clients expectations.	Discuss with supervisor and check with client carefully.
Some team member may experience prolonged working period or larger capacity than planned.	Product owner should be responsible of rearranging the workload and assign some of the sub-tasks to other development team members.

Sprint 3 Backlog

ID	As a	I want to	So that	Priority	Story Points	Status
10	User	be able to see the hint to a particular question	I can get some help when I find myself stuck.	Medium	5	COMPLETED in sprint 3
12	User	get code generated by the LLM model to be correct and functional based on the questions generated previously.	ensuring that the output is reliable and accurate for use in real-world applications.	High	8	COMPLETED in sprint 3

 Sprint Review

 Sprint 1

Sprint 1 Retrospective Meeting

Data: Aug 27, 2024

Project: Parson's Problem Sprint 1

Attendee: [@Yiru Liu](#) [@Jiayi Wang](#) [@Yan Gong](#) [@Howard Li](#) [@Yifan ZHANG](#)

1. Agenda

- a. Review of the first sprint's work and accomplishments.
- b. Discussion of the client's feedback and proposed solutions.
- c. Planning for the next sprint.

2. Sprint Review

a. First Sprint Accomplishments:

- i. Successful implementation of the UI design, front-end interactive pages, and AI generation.
- ii. Positive feedback from the client on the overall progress.
- iii. Identification of areas for improvement based on client feedback, specifically regarding the "Analysis" page.

3. Client Feedback Analysis

a. Client Concern:

- i. The client expressed concern that the "Accuracy" metric on the Analysis page is too subjective.

ii. Proposed Solutions:

- 1. Solution 1: Remove the "Accuracy"
 - a. The first proposed solution is to completely remove the "Accuracy" from the Analysis page, as it may lead to confusion or misinterpretation.
- 2. Extension : From the user's perspective, consider adding other meaningful analysis or other ways to express the answers.

4. Next Sprint Planning

a. Tasks for Next Sprint:

- i. Implement the chosen solution for the "Analysis" page.
- ii. Continue refining the front-end design based on further client feedback.
- iii. The front-end improves the dashboard presentation content in admin mode, including periodic analysis for modules and real-time recording of new IP address interactive data.
- iv. Determine the data storage method and specific contents of the database
- v. Implementing the docker container to configure the python environment to execute the python script. Configuring the database for the admin, admin can select the data by particular data type, eg. topic category.
- vi. Test the utility of the LLM as expected and adjust it.
- vii. Back-end maintenance work to ensure page interactivity and fluency
- viii. Implement the Testing plan of the first stage in front, back end and AI, analyze the test results and optimize the adjustment.

b. Focus Areas:

- i. Enhancing the user experience by addressing client feedback promptly.

Sprint 1 Product Review Meeting 1

Date: Aug 26, 2024

Project: Parson's Problem Sprint 1

Attendee: [@Yiru Liu](#) [@Jiayi Wang](#) [@Yan Gong](#) [@Howard Li](#) [@Yifan ZHANG](#)

[Supervisor: Rina, Client: Geela]

1. Agenda

- a. Presentation of current UI design.
- b. Demonstration of the implemented front-end interactive pages and the interaction between front-end and back-end.
- c. Demonstrate the logic and implementation of AI generation.
- d. Show the structure and content of the database.
- e. Review of client feedback.

2. Discussion Points

a. UI Design Presentation:

- i. The current UI design was presented to the stakeholders.
- ii. General feedback from the client was positive.

b. Front-End Interaction Demonstration:

- i. The front-end interaction pages were demonstrated, showing the progress made during this sprint.
- ii. The client accepted the functionality and design implemented so far.

c. Demonstrate the logic and implementation of AI generation.

- i. Discuss and repair the problems arising from ai generation at this stage
- ii. Continue to improve the Prompt has achieved better results

d. Show the structure and content of the database.

- i. Database now can collect the problem data, include ip address, correctness, topic category and duration.
- ii. Admin can view the database when they log into admin page.

e. Client Feedback:

- i. The client provided specific feedback regarding the "Data Analysis" page.
- ii. The current "Accuracy" was highlighted as too subjective. The client suggested either removing the "Accuracy" or replacing it with a more objective statistical concept.

3. Action Items

- a. Wait for the feedback and implement the necessary changes in the next sprint.

Sprint 1 Product Review Meeting 2

Date

Sep 2, 2024

Participants

@Yiru Liu @Howard Li @Jiayi Wang @Yan Gong @Yifan ZHANG

Goals

- Discuss further client's feedbacks
- Resolve unanswered questions related to our product

Discussion topics

Client's Feedbacks On Product's UI

Topic	Feedback
Problem Statement	Looks good.
Blocks	<p>Needs Fixing.</p> <ol style="list-style-type: none">1. The lines shouldn't wrap around since it's code. Therefore, it should look exactly like it would look like if the code was in an IDE.2. The blocks have different colors, which are kind of confusing.3. The blocks have more issues in the UI demo. It appears to have a space before each block of code which is going to confuse user since indentations are important in Python.

Questions And Answers

Question	Answer
Is there any limit on the number of lines AI can generate for each question?	There is definitely a threshold of number of lines, but the threshold has to be defined by the development team.
Is sign-in function required?	No, it is not required for our product to have the sign-in function.

What information needs to be displayed in the feedback section?	1. Ip address 2. Time taken 3. Correctness 4. Problem generated time stamp
Should feedback data analytics be displayed for every individual question?	Yes, it should be.

- Discuss on how to refine our product's UI and other related aspects, based on the feedback and the answered questions?

Products Sprint 1 Flaws and Improvements

Flaw	Improvement
UI - Blocks and Indentations	<ul style="list-style-type: none"> 1. In each block of lines of code, there should not be any spaces before code. 2. The Answer area should include indentation function that allows user to add proper indentation, following the same look of the code as what it would appear in IDE. 3. Indentation should also be accounted for part of the correctness of the answer. 4. There should not be varying colors of blocks.
Currently no limit on the number of lines.	
Feedback section	<p>Correct the displaying information to the following:</p> <ul style="list-style-type: none"> 1. Ip address 2. Time taken 3. Correctness 4. Problem generated time stamp <p>Also, display the feedback every time the user submits their question.</p>

⌚ Decisions

👉 UI blocks: Add indentation before blocks; unify the color of blocks.

👉 Changes to be made in the feedback section.

Sprint 1 Reflection

Date

Sep 15, 2024

Participants

[@Yiru Liu](#) [@Jiayi Wang](#) [@Yan Gong](#) [@Howard Li](#) [@Yifan ZHANG](#)

Goals

- Discuss anything missing based on progress report feedback, then how to improve

Discussion on shortcomings

Item	Future Improvement
Missing contributor in repository	All 5 of the development team should contribute in the repository.
Incomplete decision backlog	keep a decision backlog for each upcoming sprint.
Communication with client is not outstanding	Seek for advice from the client more often (mainly through emails) .
Unclear commit messages	Commit messages need to be more descriptive ; might be helpful to have a list that keeps track of future commit messages and their detailed descriptions for the convenience of version control.

Decisions

 Keep a decision backlog for Sprint 2 and 3

 Sprint 2

Sprint 2 Retrospective Meeting

Team: Deadline Dominators

Attendees: [@Yiru Liu](#) [@Howard Li](#) [@Jiayi Wang](#) [@Yan Gong](#) [@Yifan ZHANG](#)

On this Page:

- [What Went Well](#)
- [What Could Be Improved](#)

👍 What Went Well

Object	Details
All decisions has come to an agreement and have been implemented smoothly.	See Sprint 2 Team Decisions: 2 Sprint 2 Decision Backlog for more details.
Sprint 2 plans are carried out nicely. All the functions in the Sprint 2 Backlog have been implemented.	Implemented functionalities in Sprint 2: <ul style="list-style-type: none">• 'Drop blocks here' area Indentation.• Improvement in dashboard: More precise 'Time Stamp'.• AI generated questions for topic 'CSV Read/Write'.• Record topics and contexts in database for more convenient future extensions.• Loading Page design and implementation.• Instant IDE-styled look and feedback for the rearranged blocks of code.
As 'Deadline Dominators', all 5 of development team members have completed their jobs efficiently and a couple of days ahead of any deadlines.	
Any challenges and difficulties are sorted out AS A TEAM.	Whenever anyone faces any difficulty in their particular assigned jobs, he/she would discuss the issue with the team without any hesitations.
The product is almost completed.	Most of the user stories have been completed. See Product Backlog: Product Backlog for more details.

😊 What Could Be Improved

Potential Improvement	Explanation

GitHub version control	There are still a bit of problem merging each branch into the main branch, which took us a while to fix. We should get more familiar with GitHub so that we are less prone to the risk of bringing chaos when merging our changes.
Communication with client	The communication with client could not only be done by meeting in person, but could also be through writing emails. Therefore, next time we have any questions, make sure we send email to our client immediately if we are unable to meet in person soon.
? Major Problems and Solutions	
Problem	Solution
Due to time constraints, we are unable to finish implementing all the functions that we planned to implement in this sprint.	We aim to complete the ones with higher priorities. Showing Hint (User Story ID: 9) was originally planned to be implemented in our product in this sprint, which has a low priority. We decided to make it implemented in the next sprint.
GitHub merging conflicts.	Encountering the merging conflicts, we have to manually resolve conflicts at this time. In the future, we will certainly make sure that we communicate effectively on any updates and make small, focused commits, so that we could try our best to avoid large conflicts.

Sprint 2 Product Review Meetinng

Date: Sep 23, 2024

Attendee: [@Yiru Liu](#) [@Howard Li](#) [@Jiayi Wang](#) [@Yan Gong](#) [@Yifan ZHANG](#)

👏 Team's Reflection on Product

 See [Sprint 2 Backlog](#) for a summary.

Item	Team's Self Reflections	Clients Feedback
The product returns the IDE output feedback as soon as user clicks 'Submit'. <i>Contributors:</i> Yan Gong; Howard Li	We successfully implemented the feature that provides immediate IDE output feedback upon user submission. This enhancement significantly improves the user experience by allowing developers to receive prompt responses, facilitating quicker debugging and iterative development.	NA. This function is implemented after the client's meeting.
Users can get each block indented by clicking on the block. <i>Contributors:</i> Howard Li; Jiayi Wang; Yiru Liu	The introduction of indentation guards users' correct understanding of the formatting and logics of python.	NA. This function is implemented after the client's meeting.
IP addresses are encoded by randomly generated IDs as the primary key to show for the administrator, so that users' privacy is protected. <i>Contributor:</i> Yifan Zhang	As students, we don't wish our IP addresses to be seen by administrators. This thoughtful approach ensures that sensitive user information remains protected, aligning with data protection standards and fostering user trust.	Great. This helps to protect users' privacy.
Description of question are hidden or displayed by the following steps: <ol style="list-style-type: none">When the question is initially generated, only the question description is displayed.After user clicks 'Start', the description is hidden automatically.The user can see the question again by clicking 'Show me problem'.	This feature contributes to a cleaner and more focused user interface, enabling users to control the visibility of problem descriptions as needed.	The UI design looks great.

<p>4. User can then hide the description again by clicking 'Hide problem'.</p> <p><i>Contributors:</i> Jiayi Wang; Howard Li</p>		
<p>Administrator can login based on the predefined admin key so that they can see the dashboard that records students' performance on all the questions.</p> <p><i>Contributors:</i> Howard Li; Yifan Zhang</p>	<p>By utilizing predefined admin keys, we ensure that only authorized personnel can access sensitive performance data, thereby maintaining the integrity and security of our system. The dashboard provides valuable insights into students' progress, enabling administrators to make informed decisions and tailor educational strategies effectively.</p>	<p>Great.</p>

Sprint 3

 Sprint 3 Retrospective Meeting

 Sprint 3 Product Review Meeting

Sprint 3 Retrospective Meeting

Team: Deadline Dominators

Attendees: [@Yiru Liu](#) [@Howard Li](#) [@Jiayi Wang](#) [@Yan Gong](#) [@Yifan ZHANG](#)

On this Page:

👍 What Went Well

Object	Details
All decisions has been evaluated carefully, have come to an agreement and have been implemented smoothly.	See the decision backlogs for more details: 3 Sprint 3 Decision Backlog
Refinement works are always on the right track, with adequate manual and automated tests.	All product backlogs have been completed: 3 Sprint Backlog . Testing Reports: Testings
Same as last sprint, all the works have been assigned equally, and have been completed efficiently.	As 'Deadline Dominators', all 5 of development team members have completed their jobs efficiently and a couple of days ahead of any deadlines.
Satisfactory final presentation.	All scrum team members dedicated in preparing the final presentation, so that we could show our efforts on developing the product in the past 12 weeks. As a result, the presentation and product itself have both received great feedback from the accessors. More importantly, all 5 of our developers felt proud in ourselves with the presentation, in the way that we have not only deliver the complete look of product to audiences, but also deeply enjoyed developing the product. See Product Presentation for the detailed procedure of preparing for the presentation.
Challenges and issues can always be resolved as a team.	Just like last sprint, whenever anyone faces any non-trivial difficulty in their particular assigned jobs, he/she would discuss the issue with the team without any hesitations. Then, the whole team would be here to solve the issues together.
Improvement in communication with client.	We are happy that our communication with client have been increased since the last sprint. This helps to understand more clearly of the client's

	requirements, so that we don't waste time on implementing unnecessary functionalities.
--	--

💡 What Could Be Improved

Potential Improvements	Explanation
More efficient meeting	The scrum meeting duration is sometimes longer than expected, due to inadequate meeting planning and less clear prioritization. The stand-ups could also be more time-efficient by sticking to only asking {What was done; What will be done; Any obstacles}.
Documentation	The documentation, especially the meeting minutes and decision backlogs, could be updated more regularly to ensure a clearer development process and a more transparent evidence of work.

❓ Major Problems and Solutions

Problem	Solution
Finding the most convenient way to show the product to client.	We have thought to present the product without deployment. However, we then realized that setting up several technologies is inconvenient. Thus, even though we were aware that deployment could be complicated and time consuming, we still managed to deploy our product to the cloud server. More importantly, deploying the product is such a meaningful lesson of work experience. The detailed process of deployment is recorded below: 🔗 Deployment

💻 Self-Reflection on Product

Item	Team's Reflection
Product Testing Contributors: Yan Gong; Jiayi Wang; Yifan Zhang	We put a great effort in testing the product by doing adequate manual and automated tests. This allows us fix issues to ensure both functional and non-functional performance of our product.
We made a collapsible 'Hint' section in the question page.	This is a new functionality we implemented in this Sprint. Though this may take a slightly longer AI generating time than the one without hint, this implemented functionality could aid user fundamentally if they got stuck. This helps to improve

	the willingness and confidence of user on practicing questions in our website.
The platform checks the correctness of AI generated code before presenting the code to users.	Though AI is powerful, they could make mistakes. To make sure that users don't get confused by incorrect code, we managed to check the correctness of code. This not only helps avoiding the ethical concern of accuracy of AI generated content, but also greatly guarantees users' experiences.
Deployment on cloud server	Overall, our deployment process for CodeCraft is well-executed, where we combined reliable tools such as AWS, Nginx, systemd, and Docker. In the future, there could be potential enhancements include containerizing more parts of the stack, especially the backend, to improve consistency and scalability of the product. Nonetheless, the current setup offers a solid foundation for running our application smoothly.

Sprint 3 Product Review Meeting

Date: Oct 23, 2024

Attendee: [@Yiru Liu](#) [@Howard Li](#) [@Jiayi Wang](#) [@Yan Gong](#) [@Yifan ZHANG](#)

👏 Developing Team's Reflection

Item	Team's Reflection
Product Testing Contributors: Yan Gong; Jiayi Wang; Yifan Zhang	We put a great effort in testing the product by doing adequate manual and automated tests. This allows us fix issues to ensure both functional and non-functional performance of our product.
We made a collapsible 'Hint' section in the question page.	This is a new functionality we implemented in this Sprint. Though this may take a slightly longer AI generating time than the one without hint, this implemented functionality could aid user fundamentally if they got stuck. This helps to improve the willingness and confidence of user on practicing questions in our website.
The platform checks the correctness of AI generated code before presenting the code to users.	Though AI is powerful, they could make mistakes. To make sure that users don't get confused by incorrect code, we managed to check the correctness of code. This not only helps avoiding the ethical concern of accuracy of AI generated content, but also greatly guarantees users' experiences.
Deployment on cloud server	Overall, our deployment process for CodeCraft is well-executed, where we combined reliable tools such as AWS, Nginx, systemd, and Docker. In the future, there could be potential enhancements include containerizing more parts of the stack, especially the backend, to improve consistency and scalability of the product. Nonetheless, the current setup offers a solid foundation for running our application smoothly.

Team Communication

Internal Communication



- Zoom



- Slack

Communication channel:

- Slack

Review and feedback:

- Review method: Zoom meeting or in-person meeting
- Review period: Regular meeting every week, or as soon as discussion is needed.

Communication objectives:

- The progress of each individual's work
- The difficulty and challenge (eg. technical issues; time constraints)
- Any ambiguity on the requirements of the product
- The up coming tasks

Communication with Client

Communication Method:

- In person
- Through email
- Zoom meeting

Communication objectives:

- The progress of current sprint
- Q&A about client's product requirements
- Other potential negotiations

Decision Making

Decision making framework:

- When having disagreements, discuss first.
 - If discussion works well and all team members come to an agreement, the decision simply follows what has been agreed upon.
 - If discussion does not work:

- For minor issues, we will hold a voting.
- For major disagreements, we will seek for help from the supervisor.



Testings

- [!\[\]\(ce860acce0c37d1263a23799ae5115aa_img.jpg\) Test planning for frontend](#)
- [!\[\]\(53f9fb1f5d5cfe3149e361fb4c745ae9_img.jpg\) Test planning for UI design](#)
- [!\[\]\(6ff4cae69eb18d7abd4b30d6aa4cbff2_img.jpg\) Test Planning for AI Generation](#)
- [!\[\]\(968401937a550eb39cfa1c956ac2a693_img.jpg\) Test planning for backend](#)
- [!\[\]\(bccd44589be804a14ff1d0d57625453e_img.jpg\) Test Report: PythonProblemGenerator Manual Test Execution](#)
- [!\[\]\(04e3e55e8b8346f3c7d4480cc4727c55_img.jpg\) Test Report: PythonCodeGenerator Manual Test Execution](#)
- [!\[\]\(6d65fb7457a5a1371ae214c23f136b57_img.jpg\) Test Report: IDE Execution System](#)

Test planning for frontend

Test Type:	Execution Type:
Functional Testing	1. Manual Testing (to evaluate UI responsiveness, functionality, and integration)
UI Testing	
Integration Testing	2. Automated Testing (using Jest)
Objective: To ensure that the Vue.js frontend components, interactions, and integrations with the backend are functioning correctly, including proper rendering of UI elements, interaction logic (e.g., drag-and-drop), and successful communication with the backend APIs.	
Set Up: <ol style="list-style-type: none">1. Environment: Local development environment or staging environment2. Required Tools: Browser Chrome, Vue.js devtools, Postman (for testing API calls), Jest3. Required Data: Preloaded mock data for various components, including drag-and-drop and task scenarios	
Pre-Conditions: <ol style="list-style-type: none">1. the application is successfully compiled without errors.2. Backend APIs are up and running (Spring Boot & MyBatis backends).3. The drag-and-drop component and problem section are accessible.4. Integration with the backend is properly configured.	
Notes: <ol style="list-style-type: none">1. Focus on the interaction between the front and back-end components.2. Pay special attention to the drag-and-drop logic and problem section binding with backend data.3. Pay special attention to admin dashboard only when admin is logged in.4. Looks into detail of page hierarchy and data transportation.	
Steps: <ol style="list-style-type: none">1. UI Component Rendering<ul style="list-style-type: none">• Goal: Verify that all Vue.js components (e.g., buttons, blocks) render properly on page load.• Step: Open the webpage and visually confirm that all components are displayed correctly.• Expected Result: All UI elements should be properly aligned, and the page should load without errors.2. Drag-and-Drop Functionality<ul style="list-style-type: none">• Goal: Ensure drag-and-drop blocks work as expected.• Step: Perform drag-and-drop actions between containers.• Expected Result: Blocks should move smoothly between containers, and positions should update without issues.	

3. Data Binding & API Integration

- **Goal:** Validate that the data received from the backend (via `/problem` endpoint) is correctly displayed.
- **Step:** Load the page and check if problem scenarios and task details are displayed correctly.
- **Expected Result:** Data from the backend should be reflected in the UI without lag or errors.

4. Event Handling (Button Clicks & Rebuild Method)

- **Goal:** Ensure that button clicks trigger the correct methods and the problem section rebuilds as expected.
- **Step:** Click buttons for binding functions and monitor the console for any errors.
- **Expected Result:** Buttons should trigger the correct Vue methods and invoke the rebuild of problem components.

Time constraint:

- **Minimum:** 20 minutes (basic functional and UI testing)
- **Maximum:** 2 hours (comprehensive testing of all frontend components and integrations)

Test planning for UI design

UI Test Case1--- Verify the consistency and accessibility of UI elements

Test Type: Functional	Execution Type: Manual
Objective: Make sure that all UI elements (buttons, text boxes, ICONS, etc.) are displayed correctly on a variety of devices and resolutions, with colors and sizes that conform to design specifications.	
Set Up: I Designers already have the latest UI design specifications. I The test environment has been set up, including a variety of resolution and device type of simulator.	
Post-Conditions: If problems are found, document the details and notify the design team to make adjustments.	
Notes: Steps: I Opens the app on standard resolution devices (such as 1080p monitors). I I Check whether all UI elements according to the design specification. I I Switch to a different resolution and equipment (such as 4 k display, tablet and mobile phone). I I Once again check all UI elements show consistency and accessibility.	
Time constraint: Minimum: 30 minutes Maximum: 1 hour	

UI Test Case2 --- Verify the availability of functional elements

Functional description:As a user, I want the navigation elements of the application to be easy to understand and manipulate so that I can quickly and accurately access different parts of the application.

Test Type: Functional	Execution Type: Manual
Objective: Ensure that navigation elements (such as back buttons, tabs, etc.) not only visually conform to the design specification, but also functionally guide the intended page correctly, with smooth operation and a good user experience.	
Set Up: I The UI design has been completed according to the latest design specifications. I All navigation elements have been implemented in the development environment.	
Post-Conditions:	

If problems are found, document the details and notify the design team to make adjustments.

Notes:

Steps:

- I Open the application and go to the main screen.
- I Click on each navigational element on the main screen, such as a menu item, button, or link.
- I Verify that the page jumps to the target screen correctly after each click.
- I Check the responsive performance of the navigation elements on different devices (e.g., mobile, tablet, desktop).
- I Repeat the above steps across different operating systems and browsers.
- I Document any functional errors or user interfaces that do not meet design specifications.

Time constraint:

Minimum: 10 minutes

Maximum: 2 hour

Expected outcome:

- I All navigation elements should lead to the appropriate page correctly and without delay when clicked.
- I The visual presentation of the navigation elements should strictly conform to the design specifications, including color, size, spacing and icons.
- I User interaction is smooth and free of any technical glitches.

Test Planning for AI Generation

AI Generation Test Case1--- Verify the consistency of questions generated by the LLM Model

Functional description: As a user, I want the questions generated by the LLM model to be consistent in quality, and relevance to ensure a fair and balanced assessment of the interaction experience.

Test Type: Functional	Execution Type: Manual
Objective: Ensure that the questions generated by the LLM model are consistent in terms of difficulty, relevance to the topic. The output should align with predefined topic and context to provide a reliable user experience.	
Set Up: 1. The LLM model has been connected and trained in the testing environment. 2. A set of predefined topics and contexts are established for consistency checks.	
Post-Conditions: If inconsistencies or errors are found, document the details and notify the development team for further investigation and adjustment.	
Notes: Use a diverse range of topics and contexts for testing to ensure comprehensive coverage.	
Steps: 1. Generate a set of questions using the LLM model for specific topics and contexts. 2. Review the generated questions for consistency in difficulty and relevance. 3. Document any inconsistencies in output.	
Time constraint: Minimum: 30 minutes Maximum: 3 hours	
Expected outcome: The LLM model generates questions that are consistent in difficulty and relevance.	

AI Generation Test Case2 --- Verify the correctness of code generated by the LLM model based on previous questions.

Functional description: As a user, I want the code generated by the LLM model to be correct and functional based on the questions generated previously, ensuring that the output is reliable and accurate for use in real-world applications.

Test Type: Functional	Execution Type: Manual
Objective:	

Ensure that the code generated by the LLM model is syntactically correct, logically sound, and meets the requirements of the given prompts. The code should be executable and produce the expected results without errors.

Set Up:

1. The LLM model has been connected and trained in the testing environment.
2. Set up a Python IDE in Backend.
3. A set of pre-generated questions are used to generate code for validation.

Post-Conditions:

If issues are found in the generated code, document the errors and notify the development team for further model refinement.

Notes:

Test cases should cover a variety of problem types, and difficulty levels to ensure comprehensive coverage.

Steps:

1. Generate code using the LLM model based on a set of pre-generated questions.
2. Review the generated code for syntax correctness.
3. Execute the generated code in Python IDE.
4. Verify that the code produces the expected output without errors.
5. Document any errors or inconsistencies found during testing.

Time constraint:

Minimum: 45 minutes

Maximum: 2 hours

Expected outcome:

1. The LLM model generates code that is syntactically correct and logically sound.
2. The generated code should be executable without errors and produce the expected results.
3. The code should follow best practices and be appropriate for the given problem context.

Test planning for backend

Test Type: Unit Testing Integration Testing API Testing Database Testing	Execution Type: Manual Testing (using Postman for API validation, database querying) Automated Testing (using JUnit for unit tests, Mockito for mocking dependencies)
Objective: To ensure that the backend services, including API endpoints, business logic, database integration (MyBatis), and data processing, are functioning correctly and efficiently. This includes validating correct communication with the Vue.js frontend.	
Set Up: 1. Environment: Local development environment or staging environment 2. Required Tools: Postman (for API testing), MySQL Database, JUnit, Mockito, Spring Boot DevTools 3. Required Data: Test data in MySQL (tables populated with required entities)	
Pre-Conditions: 1. Backend application is successfully running (Spring Boot project compiles and starts without errors). 2. The MySQL database is properly set up and running. 3. API contracts between frontend and backend are defined. 4. Admin account credentials and user access control are configured.	
Steps: 1. API Endpoint Testing (Functional Testing) <ul style="list-style-type: none">• Goal: Validate the correct functioning of RESTful API endpoints, focusing on <code>/problem</code>.• Step: Use Postman or cURL to send requests to all available endpoints (e.g., <code>/problem</code>, <code>/admin</code>).• Expected Result: The API should respond with the correct status codes and data (200 for successful requests, 404/500 for errors). 2. Data Processing and JSON Response (Integration Testing) <ul style="list-style-type: none">• Goal: Ensure the backend correctly processes requests, executes business logic, and sends accurate JSON responses to the frontend.• Step: Send a request to the backend with a test scenario and verify the structure and content of the JSON response.• Expected Result: The response should have all required fields (e.g., tasks, data) properly structured in the JSON format. 3. Database Integration (Database Testing) <ul style="list-style-type: none">• Goal: Confirm that database interactions (via MyBatis) are functioning as expected.• Step: Execute API requests that read/write data to/from the MySQL database (e.g., saving problem data, fetching tasks).	

- **Expected Result:** The data should be correctly retrieved or updated in the MySQL tables without errors, and MyBatis queries should run as intended.

4. Admin and User Access Control (Security Testing)

- **Goal:** Ensure that only admin accounts can access specific endpoints and data.
- **Step:** Attempt to access `/admin` endpoint with a non-admin account.
- **Expected Result:** Non-admin users should be denied access with a 403 Forbidden response.

5. Unit Tests (Business Logic Testing)

- **Goal:** Test individual service methods and business logic in isolation.
- **Step:** Write JUnit tests for core service methods and use Mockito to mock dependencies.
- **Expected Result:** Service methods should return expected results or exceptions when necessary, passing all unit tests.

6. Exception Handling

- **Goal:** Verify that the backend handles exceptions gracefully and provides meaningful error messages.
- **Step:** Simulate scenarios where the backend may fail (e.g., missing data, invalid requests).
- **Expected Result:** The backend should return appropriate error responses (400 Bad Request, 500 Internal Server Error) and log errors.

Time constraint:

- **Minimum:** 45 minutes (basic API testing, unit tests)
- **Maximum:** 3 hours (thorough database and integration testing, access control)

Test Report: PythonProblemGenerator Manual Test Execution

Project Name: AI_Generation

Test Document Date: Sep 22, 2024

Test By: @Yan Gong

Test Description

The `PythonProblemGenerator` class is responsible for generating problem descriptions based on a given `topic` and `context`. This is done by invoking a Docker container that runs a Python script (`Generate_Question.py`). The test aims to ensure that the class correctly handles the Docker invocation, processes the generated problem output, and formats it into a JSON object.

Test Plan

- **Component Tested:** `PythonProblemGenerator`
 - **Test Type:** Manual execution of problem generation
 - **Preconditions:**
 - Docker is installed and running.
 - The `rita6667/gemini-app:latest` Docker image is pulled and available locally.
 - The `Generate_Question.py` script inside the Docker container is functioning correctly.
-

Test Case: AI-01

- **Test Case Name:** Successful Problem Generation from Python Script
- **Preconditions:**
 - Docker is installed and running.
 - The Docker image `rita6667/gemini-app:latest` is pulled and available locally.
- **Steps:**
 - Run the Java method `generateProblem()` in the `PythonProblemGenerator` class with the parameters:
 - `topic: Linear Regression`
 - `context: Predicting Sales Based on Advertising Spend`
 - Check the output returned in the terminal.

- **Expected Output:**
 - JSON output containing `scenario`, `task`, and `data` fields in the expected format.
 - Data should not contain unnecessary whitespace or Python references.

- **Actual Results:**
 - The terminal returned the following JSON output:

```
1  {"scenario": "A leading online retailer wants to optimize its advertising budget by predicting future sales based on past advertising spending. They have gathered data on their monthly advertising expenditure across various platforms and the corresponding sales generated. Your task is to build a linear regression model that can predict future sales based on the advertising budget.",  
2  "task": [  
3    "1. Load the provided sales and advertising data into a Pandas DataFrame.",  
4    "2. Explore the data for any patterns and relationships using visualizations like scatter plots.",
```

```

5     "3. Split the data into training and testing sets.",
6     "4. Train a linear regression model on the training data.",
7     "5. Evaluate the model's performance on the testing data using metrics like R-squared and Mean
    Squared Error (MSE).",
8     "6. Use the trained model to predict sales for a given advertising budget."],
9   "data": [
10     {"Month": "January", "Sales": 50000, "Advertising Spend": 10000},
11     {"Month": "February", "Sales": 60000, "Advertising Spend": 12000},
12     {"Month": "March", "Sales": 75000, "Advertising Spend": 15000},
13     {"Month": "April", "Sales": 90000, "Advertising Spend": 18000},
14     {"Month": "May", "Sales": 100000, "Advertising Spend": 20000},
15     {"Month": "June", "Sales": 110000, "Advertising Spend": 22000},
16     {"Month": "July", "Sales": 125000, "Advertising Spend": 25000},
17     {"Month": "August", "Sales": 140000, "Advertising Spend": 28000},
18     {"Month": "September", "Sales": 150000, "Advertising Spend": 30000},
19     {"Month": "October", "Sales": 160000, "Advertising Spend": 32000},
20     {"Month": "November", "Sales": 175000, "Advertising Spend": 35000},
21     {"Month": "December", "Sales": 190000, "Advertising Spend": 38000}]}

```

- The JSON was correctly formatted, and there was no unnecessary whitespace or Python references in the `data` field.

- Postconditions:**

- JSON object was returned successfully and met the expected structure.

- Result: Pass**

Test Case: AI-02

- Test Case Name:** Failure due to Docker Error

- Preconditions:**

- Docker is installed, but the Python script or Docker image simulates failure

- Steps:**

- Modify the Docker environment or simulate a failure.
- Run the Java method `generateProblem()` with valid parameters:
 - `topic: Linear Regression`
 - `context: Predicting Sales Based on Advertising Spend`
- Observe whether the process fails gracefully.

- Expected Output:**

- `null` or error handling message in the Java console.

- Actual Results:**

- Docker simulation failure.
- The terminal returned an error message was logged:

```

1 Exception in thread "main" org.json.JSONException: A JSONObject text must begin with '{' at 0 [character 1
line 1]
2     at org.json.JSONTokener.syntaxError(JSONTokener.java:507)
3     at org.json.JSONObject.<init>(JSONObject.java:222)
4     at org.json.JSONObject.<init>(JSONObject.java:406)
5     at com.parsons.aigeneration.PythonProblemGenerator.generateProblem(PythonProblemGenerator.java:55)
6     at com.parsons.aigeneration.Driver.main(Driver.java:18)

```

- Postconditions:**

- The error was handled gracefully, and no output was generated beyond the logged error message.

- Result: Pass**

Test Case: AI-03

- **Test Case Name:** Handling CSV Data in Problem Generation
- **Preconditions:**
 - Docker is installed and running.
 - The Python script is capable of generating CSV content in the `data` field.
- **Steps:**

- a. Run the Java method `generateProblem()` with the parameters:

```
■ topic: read/write csv files  
■ context: Data Collection and Reporting
```

- b. Check the output JSON for the `data` field containing a CSV filename.

- c. Verify that the CSV file is saved in the `/IDE/src/tmp/` directory.

- **Expected Output:**

- A valid CSV file should be saved in the specified directory.
- The JSON output should correctly describe the filename and its contents.

- **Actual Results:**

- The terminal returned the following JSON output:

```
1 {  
2   "scenario": "You are a data analyst for a social media platform, and you need to collect and analyze user engagement data for a specific campaign. You receive the data in a CSV file from the marketing team, which includes information on the number of likes, comments, shares, and views for each post associated with the campaign. You need to read this data into a Python program, process it, and create a report summarizing the campaign's performance.",  
3   "task": [  
4     "1. Read the provided CSV file into a Pandas DataFrame.",  
5     "2. Calculate the total number of likes, comments, shares, and views for the entire campaign.",  
6     "3. Calculate the average number of likes, comments, shares, and views per post.",  
7     "4. Create a bar chart visualizing the total number of likes, comments, shares, and views.",  
8     "5. Save the generated report (including the chart) as a new CSV file."  
9   ],  
10  "data": "campaign_data.csv\nPost  
ID,Likes,Comments,Shares,Views\n1,150,20,5,1000\n2,200,15,8,1200\n3,180,10,6,900\n4,250,25,10,1500\n5,160,12,4,800"  
11 }
```

- Upon inspection of the `/IDE/src/tmp/` directory, the file `sales_data.csv` was found and contained the following data:

```
1 Post ID,Likes,Comments,Shares,Views  
2 1,150,20,5,1000  
3 2,200,15,8,1200  
4 3,180,10,6,900  
5 4,250,25,10,1500  
6 5,160,12,4,800
```

- The CSV file was correctly saved, and the data matched the JSON output.

- **Postconditions:**

- The CSV file was saved in the correct directory and contained the expected data.

- **Result: Pass**

Test Report: PythonCodeGenerator Manual Test Execution

Project Name: AI_Generation

Test Document Date: Sep 22, 2024

Test By: @Yan Gong

Test Description

The `PythonCodeGenerator` class is responsible for generating Python code by invoking a Docker container that runs a Python script (`Generate_Code.py`). The script takes a scenario, task, and optional data as input. The purpose of this test is to ensure that the class correctly handles the Docker invocation, processes the generated code output, and formats it into a JSON object.

Test Plan

- **Component Tested:** `PythonCodeGenerator`
 - **Test Type:** Manual execution of code generation
 - **Preconditions:**
 - Docker is installed and running.
 - The `rita6667/gemini-app:latest` Docker image is pulled and available locally.
 - The `Generate_Code.py` script inside the Docker container is functioning correctly.
-

Test ID: AI-04

- **Test Name:** Successful code generation with provided data
- **Preconditions:**
 - Docker is installed and running.
 - Valid data is provided for code generation.
- **Steps:**
 - a. Instantiate `PythonCodeGenerator` with the following parameters:

```
■ 1  {
  2    "scenario": "You are a data analyst for a social media platform, and you need to collect and analyze user engagement data for a specific campaign. You receive the data in a CSV file from the marketing team, which includes information on the number of likes, comments, shares, and views for each post associated with the campaign. You need to read this data into a Python program, process it, and create a report summarizing the campaign's performance.",
  3    "task": [
  4      "1. Read the provided CSV file into a Pandas DataFrame.",
  5      "2. Calculate the total number of likes, comments, shares, and views for the entire campaign.",
  6      "3. Calculate the average number of likes, comments, shares, and views per post.",
  7      "4. Create a bar chart visualizing the total number of likes, comments, shares, and views.",
  8      "5. Save the generated report (including the chart) as a new CSV file."
  9    ],
 10    "data": "campaign_data.csv\nPost
ID,Likes,Comments,Shares,Views\n1,150,20,5,1000\n2,200,15,8,1200\n3,180,10,6,900\n4,250,25,10,1500\n5,
160,12,4,800"
11 }
```

- b. Call the `generateCode()` method.
- c. Observe the output generated in the terminal.

- **Expected Output:**

- The method returns a JSON object with Python code that reads and processes the CSV data.

- **Actual Results:**

- The terminal returned the following JSON output:

```

 1 {"code": [
 2     "import pandas as pd",
 3     "import matplotlib.pyplot as plt",
 4     "def analyze_campaign(filename):",
 5     "    try:",
 6     "        df = pd.read_csv(filename)",
 7     "    except FileNotFoundError:",
 8     "        print(f'Error: File not found - {filename}\')",
 9     "        return None",
10     "    except pd.errors.EmptyDataError:",
11     "        print(f'Error: Empty data in file - {filename}\')",
12     "        return None",
13     "    except Exception as e:",
14     "        print(f'Error reading data: {e}\')",
15     "        return None",
16     "    total_likes = df['Likes'].sum(),
17     "    total_comments = df['Comments'].sum(),
18     "    total_shares = df['Shares'].sum(),
19     "    total_views = df['Views'].sum(),
20     "    avg_likes = df['Likes'].mean(),
21     "    avg_comments = df['Comments'].mean(),
22     "    avg_shares = df['Shares'].mean(),
23     "    avg_views = df['Views'].mean(),
24     "    engagement_types = ['Likes', 'Comments', 'Shares', 'Views'],
25     "    total_engagement = [total_likes, total_comments, total_shares, total_views],
26     "    plt.bar(engagement_types, total_engagement)",
27     "    plt.xlabel('Engagement Type')",
28     "    plt.ylabel('Total Count')",
29     "    plt.title('Campaign Engagement Summary')",
30     "    plt.tight_layout()",
31     "    plt.savefig('campaign_engagement_chart.png')",
32     "    plt.close()",
33     "    results = {'Metric': ['Total Likes', 'Total Comments', 'Total Shares', 'Total Views', 'Average Likes', 'Average Comments', 'Average Shares', 'Average Views'],
34     "               'Value': [total_likes, total_comments, total_shares, total_views, avg_likes, avg_comments, avg_shares, avg_views]}",
35     "    results_df = pd.DataFrame(results)",
36     "    results_df.to_csv('campaign_results.csv', index=False)",
37     "    return {'total_likes': total_likes,
38             'total_comments': total_comments,
39             'total_shares': total_shares,
40             'total_views': total_views,
41             'avg_likes': avg_likes,
42             'avg_comments': avg_comments,
43             'avg_shares': avg_shares,
44             'avg_views': avg_views}",
45     "results = analyze_campaign('campaign_data.csv')",
46     "if results:",
47     "    print(\"Campaign Analysis Results:\")",
48     "    print(f'Total Likes: {results['total_likes']}')",

```

```

49     "    print(f\"Total Comments: {results['total_comments']}\")",
50     "    print(f\"Total Shares: {results['total_shares']}\")",
51     "    print(f\"Total Views: {results['total_views']}\")",
52     "    print(f\"Average Likes: {results['avg_likes']:.2f}\")",
53     "    print(f\"Average Comments: {results['avg_comments']:.2f}\")",
54     "    print(f\"Average Shares: {results['avg_shares']:.2f}\")",
55     "    print(f\"Average Views: {results['avg_views']:.2f}\")",
56     "    print(\"Results saved to 'campaign_results.csv'\")",
57     "    print(\"Chart saved to 'campaign_engagement_chart.png'\")"
58 }

```

- The JSON was correctly formatted and the content is correct.

- **Postconditions:**

- The output JSON object should contain Python code that correctly handles the provided CSV data.

- **Result: Pass**

Test Case: AI-06

- **Test Case Name:** Failure due to Docker Error

- **Preconditions:**

- Docker is installed, but the Python script or Docker image simulates failure

- **Steps:**

- Modify the Docker environment or simulate a failure.

- Run the Java method `PythonCodeGenerator` with valid parameters:

```

1  {
2      "scenario": "You are a data analyst for a social media platform, and you need to collect and analyze
3          user engagement data for a specific campaign. You receive the data in a CSV file from the marketing
4          team, which includes information on the number of likes, comments, shares, and views for each post
5          associated with the campaign. You need to read this data into a Python program, process it, and create
6          a report summarizing the campaign's performance.",
7      "task": [
8          "1. Read the provided CSV file into a Pandas DataFrame.",
9          "2. Calculate the total number of likes, comments, shares, and views for the entire campaign.",
10         "3. Calculate the average number of likes, comments, shares, and views per post.",
11         "4. Create a bar chart visualizing the total number of likes, comments, shares, and views.",
12         "5. Save the generated report (including the chart) as a new CSV file."
13     ],
14     "data": "campaign_data.csv\nPost
15 ID,Likes,Comments,Shares,Views\n1,150,20,5,1000\n2,200,15,8,1200\n3,180,10,6,900\n4,250,25,10,1500\n5,
16 160,12,4,800"
17 }

```

- Observe whether the process fails gracefully.

- **Expected Output:**

- `null` or error handling message in the Java console.

- **Actual Results:**

- Docker simulation failure.

- The terminal returned an error message was logged:

```

1 Exception in thread "main" org.json.JSONException: A JSONObject text must begin with '{' at 0 [character 1
2 line 1]
3     at org.json.JSONTokener.syntaxError(JSONTokener.java:507)
4     at org.json.JSONObject.<init>(JSONObject.java:222)
5     at org.json.JSONObject.<init>(JSONObject.java:406)

```

```
5      at com.parsons.aigeneration.PythonProblemGenerator.generateProblem(PythonProblemGenerator.java:55)
6      at com.parsons.aigeneration.Driver.main(Driver.java:18)
```

- **Postconditions:**

- The error was handled gracefully, and no output was generated beyond the logged error message.

- **Result: Pass**

Test Case: AI-05

- **Test Name:** Verify that the generated Python code is correctly formatted into JSON

- **Preconditions:**

- Docker is installed and running.
- Valid scenario, task, and data are provided.

- **Steps:**

- a. Instantiate `PythonCodeGenerator` with the following parameters:

```
i. 1  {
 2      "scenario": "A medical research team is studying the relationship between physical activity levels
 3          and blood pressure in a population of adults. They have collected data on the average daily steps
 4          taken and systolic blood pressure readings for a group of participants.",
 5      "task": [
 6          "Using Python, calculate the correlation coefficient between the average daily steps and systolic
 7          blood pressure.",
 8          "Analyze the results to determine if there is a statistically significant correlation and
 9          interpret its meaning in the context of the medical research.",
10          "Visualize the relationship between the two variables using a scatter plot."
11      ],
12      "data": [
13          {"systolic_bp": 120, "steps": 7500},
14          {"systolic_bp": 130, "steps": 5000},
15          {"systolic_bp": 115, "steps": 10000},
16          {"systolic_bp": 140, "steps": 3000},
17          {"systolic_bp": 125, "steps": 9000},
18          {"systolic_bp": 135, "steps": 6000},
19          {"systolic_bp": 118, "steps": 8000},
20          {"systolic_bp": 145, "steps": 4000}
21      ]
22  }
```

- b. Call the `generateCode()` method.

- c. Inspect the JSON output.

- **Expected Output:**

- The JSON object should contain a `code` array where each line of Python code is a separate element.

- **Actual Results:**

- The terminal returned the following JSON output:

- ```
1 {"code": [
 2 "import pandas as pd",
 3 "import matplotlib.pyplot as plt",
 4 "import numpy as np",
 5 "data = [{\"systolic_bp\": 120, \"steps\": 7500}, {\"systolic_bp\": 130, \"steps\": 5000},
 6 {\"systolic_bp\": 115, \"steps\": 10000}, {\"systolic_bp\": 140, \"steps\": 3000}, {\"systolic_bp\": 125,
 7 \"steps\": 9000}, {\"systolic_bp\": 135, \"steps\": 6000}, {\"systolic_bp\": 118, \"steps\": 8000},
 8 {\"systolic_bp\": 145, \"steps\": 4000}]",
 9 "df = pd.DataFrame(data)"}
```

```

7 "correlation = df['steps'].corr(df['systolic_bp'])",
8 "print(f\"Correlation coefficient: {correlation}\")",
9 "plt.scatter(df['steps'], df['systolic_bp'])",
10 "plt.xlabel('Average Daily Steps')",
11 "plt.ylabel('Systolic Blood Pressure')",
12 "plt.title('Relationship between Steps and Systolic Blood Pressure')",
13 "plt.show()"
14]

```

- **Postconditions:**

- The generated code is split into lines, each stored in the `code` array.

- **Result: Pass**

---

#### Test Case ID: AI-06

- **Test Name:** Test Using Provided Data in Code Generation

#### Preconditions:

- Docker is installed and configured correctly.
- Valid scenario, task, and data are provided.

#### Test Steps:

- Provide the scenario, tasks, and specific data inputs to the Python code generator.
- Run the Java method `PythonCodeGeneratoron`.
- Check the generated code and whether the provided code is consistent or not.

#### Expected Results:

- The generated Python code should contain references to the provided data and include logic to process this data.

#### Actual Results:

- The Python code did not utilize the provided data. Instead, it processed unrelated data or did not reference the CSV file at all.
- The provided data was:

```

1 {
2 "users": [
3 {"id": 1, "genres": ["Action", "Sci-Fi"]},
4 {"id": 2, "genres": ["Comedy", "Drama", "Romance"]},
5 {"id": 3, "genres": ["Action", "Comedy", "Sci-Fi"]},
6 {"id": 4, "genres": ["Romance", "Drama", "Comedy"]},
7 {"id": 5, "genres": ["Action", "Sci-Fi", "Thriller"]},
8 {"id": 6, "genres": ["Drama", "Romance", "Comedy"]},
9 {"id": 7, "genres": ["Action", "Thriller", "Horror"]},
10 {"id": 8, "genres": ["Comedy", "Drama", "Romance"]},
11 {"id": 9, "genres": ["Sci-Fi", "Action", "Thriller"]},
12 {"id": 10, "genres": ["Action", "Thriller"]}
13]
14 }

```

- The generated code snippet was:

```

1 import pandas as pd
2
3 order_data = [
4 {"order_id": 1, "product_id": 101, "quantity": 2, "price": 10.00},
5 {"order_id": 2, "product_id": 102, "quantity": 1, "price": 20.00},

```

```
6 {"order_id": 3, "product_id": 101, "quantity": 3, "price": 10.00},
7 {"order_id": 4, "product_id": 103, "quantity": 2, "price": 15.00},
8 {"order_id": 5, "product_id": 102, "quantity": 2, "price": 20.00}
9]
10
11 product_data = [
12 {"product_id": 101, "product_name": "Laptop"},
13 {"product_id": 102, "product_name": "Smartphone"},
14 {"product_id": 103, "product_name": "Tablet"}
15]
16
17 df_orders = pd.DataFrame(order_data)
18
```

- **Postconditions:**

- The generated Python code should contain references to the provided data and include logic to process this data.

- **Result: Fail**

# Test Report: IDE Execution System

**Project Name:** AI\_Generation

**Test Document Date:** Sep 22, 2024

**Test By:** @Yan Gong @Howard Li

---

## Test Description

The IDE Execution System consists of three primary components:

1. `PythonFileWriter`: Responsible for saving Python code into a `.py` file at a specified file path.
2. `DockerExecutor`: Responsible for executing a Python file inside a Docker container and capturing the output (stdout and stderr).
3. `PythonFileExecutor`: A higher-level component that orchestrates the saving of the Python file via `PythonFileWriter` and executes it via `DockerExecutor`.

The purpose of this test is to validate the full functionality of the IDE system by:

1. Ensuring that Python files are correctly saved.
2. Verifying that Docker can execute these files and handle both successful and erroneous cases.
3. Capturing the output (both success and failure) from the Docker execution.

The tests focus on ensuring proper interaction between these components and handling errors gracefully, such as invalid file paths and Python execution errors.

---

## Test Case: IDE-01

- **Test Case Name:** Python Script Saving Using `PythonFileWriter`
  - **Preconditions:**
    - The directory path where the Python script should be saved exists.
    - The Python code to be saved is provided as a string.
  - **Steps:**
    - Create an instance of `PythonFileWriter`.
    - Call the `savePythonScript()` method with valid Python code and a valid file path (`/tmp/test_script.py`).
    - Verify if the Python script is saved successfully in the specified directory.
  - **Expected Output:**
    - The Python code is successfully saved as a `.py` file at the specified path.
  - **Actual Results:**
    - The file `test_script.py` was created in `/tmp/` and the Python code was correctly written to it.
  - **Postconditions:**
    - The file path should exist and contain the correct Python code.
  - **Result: Pass**
- 

## Test Case: IDE-02

- **Test Case Name:** Successful Python Execution in Docker Using `DockerExecutor`
- **Preconditions:**

- Docker is installed and running.
- The `test_script.py` exists in the `/tmp/` directory with valid Python code.
- A valid Docker image (`python:3.8`) is available for running the Python code.

• **Steps:**

- Instantiate `DockerExecutor` with the Docker image `python:3.8`.
- Call the `executePythonFile()` method, providing the `/tmp/` directory and the `test_script.py` as parameters.

```

1 import nltk
2 def split_sentence(sentence):
3 words = nltk.word_tokenize(sentence)
4 return words
5
6 sentence = 'This is an example sentence to split.'
7 words = split_sentence(sentence)
8 print(f'Words in the sentence: {words}')

```

- Capture and verify the output (stdout and stderr).

• **Expected Output:**

- The Python code is executed successfully inside the Docker container.
- The output contains the correct results from the Python script, and there are no errors in stderr.

• **Actual Results:**

- The Docker container ran successfully, and the stdout captured the output from the Python script as expected.

```

1 Stdout:
2 Words in the sentence: ['This', 'is', 'an', 'example', 'sentence', 'to', 'split', '.']
3 Stderr:
4

```

• **Postconditions:**

- The output JSON contains the `stdout` with the correct Python execution results and an empty `stderr`.

• **Result: Pass**

### Test Case: IDE-03

• **Test Case Name:** Handling Python Execution Errors in Docker

• **Preconditions:**

- Docker is installed and running.
- The `test_script.py` contains erroneous Python code (e.g., a `SyntaxError`).

• **Steps:**

- Modify `test_script.py` to include invalid Python syntax.

```

b. 1 def divide(a, b):
 2 return a / b
 3
 4 num1 = 10
 5 num2 = 0 # Dividing by zero
 6 result = divide(num1, num2)
 7 print('Result:', result)

```

Call the `executePythonFile()` method of `DockerExecutor`.

- Observe and verify the captured error output (stderr).

• **Expected Output:**

- The `stderr` contains the Python `SyntaxError` or any other exception generated during execution.
- The `stdout` should be empty or partially executed before the error.

• **Actual Results:**

- The `stderr` captured the Python `SyntaxError`, and `stdout` was empty.

```

1 Stdout:
2
3 Stderr:
4 Traceback (most recent call last):
5 File "/app/code.py", line 6, in <module>
6 result = divide(num1, num2)
7 File "/app/code.py", line 2, in divide
8 return a / b
9 ZeroDivisionError: division by zero

```

• **Postconditions:**

- The output JSON correctly reflects the error in `stderr`.

• **Result: Pass**

---

#### Test Case: IDE-04

• **Test Case Name:** Full Execution Flow Using `PythonFileExecutor`

• **Preconditions:**

- Docker is installed and running.
- The `PythonFileWriter` and `DockerExecutor` components are fully functional.
- Valid Python code is provided for execution.

• **Steps:**

- Instantiate `PythonFileWriter` and `DockerExecutor` with the Docker image `python:3.8`.
- Instantiate `PythonFileExecutor` using the above objects.
- Call the `executePythonCode()` method with valid Python code, the `/tmp/` directory, and the script name `test_script.py`.

```

d. 1 import pandas as pd
2 from sklearn.linear_model import LinearRegression
3 from sklearn.model_selection import train_test_split
4 from sklearn.metrics import mean_squared_error, r2_score
5
6 data = [
7 {"Month": "January", "Sales Revenue": 50000, "Advertising Spend": 10000},
8 {"Month": "February", "Sales Revenue": 60000, "Advertising Spend": 12000},
9 {"Month": "March", "Sales Revenue": 75000, "Advertising Spend": 15000},
10 {"Month": "April", "Sales Revenue": 90000, "Advertising Spend": 18000},
11 {"Month": "May", "Sales Revenue": 100000, "Advertising Spend": 20000},
12 {"Month": "June", "Sales Revenue": 110000, "Advertising Spend": 22000},
13 {"Month": "July", "Sales Revenue": 125000, "Advertising Spend": 25000},
14 {"Month": "August", "Sales Revenue": 140000, "Advertising Spend": 28000},
15 {"Month": "September", "Sales Revenue": 150000, "Advertising Spend": 30000},
16 {"Month": "October", "Sales Revenue": 160000, "Advertising Spend": 32000},
17 {"Month": "November", "Sales Revenue": 175000, "Advertising Spend": 35000},
18 {"Month": "December", "Sales Revenue": 190000, "Advertising Spend": 38000}
19]
20
21 df = pd.DataFrame(data)
22 model = LinearRegression()
23 X = df['Advertising Spend'].values.reshape(-1, 1) # Reshape for linear regression

```

```

24 y = df['Sales Revenue'].values
25 X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
26 model.fit(X_train, y_train)
27 intercept = model.intercept_
28 coefficient = model.coef_[0]
29 y_pred = model.predict(X_test)
30 rmse = mean_squared_error(y_test, y_pred, squared=False) # Root Mean Squared Error
31 r_squared = r2_score(y_test, y_pred) # R-squared value
32 print(f"Intercept: {intercept}")
33 print(f"Coefficient: {coefficient}")
34 print(f"RMSE: {rmse}")
35 print(f"R-squared: {r_squared}")
36
37 predictions = model.predict(X)
38 increased_budget = df['Advertising Spend'].values[-1] * 1.20 # Increase by 20%
39 predicted_sales = model.predict([[increased_budget]])
40 print(f"Predicted sales with increased budget: {predicted_sales[0]}")

```

e. Observe the entire flow, from saving the file to executing the Python script.

- **Expected Output:**

- The Python code is saved to `/tmp/test_script.py` and executed inside the Docker container.
- The results (both stdout and stderr) are captured and returned as a JSON object.

- **Actual Results:**

- The entire process was executed successfully. The Python script was saved, executed in Docker, and the results were returned as expected.

```

o 1 Stdout:
 2 Intercept: 0.0
 3 Coefficient: 5.000000000000001
 4 RMSE: 2.413162139677588e-11
 5 R-squared: 1.0
 6 Predicted sales with increased budget: 228000.00000000003
 7
 8 Stderr:
 9 /usr/local/lib/python3.10/site-packages/scikit-learn/metrics/_regression.py:492: FutureWarning: 'squared' is
 deprecated in version 1.4 and will be removed in 1.6. To calculate the root mean squared error, use the
 function 'root_mean_squared_error'.
10 warnings.warn(
11

```

- **Postconditions:**

- The output JSON should contain the correct results from the Python script execution.

- **Result: Pass**

### Test Case: IDE-05

- **Test Case Name:** Failure in Script Saving Using `PythonFileWriter`

- **Preconditions:**

- The directory path provided is invalid or unwritable (e.g., a directory without write permissions).

- **Steps:**

- a. Instantiate `PythonFileWriter`.

- b. Call `savePythonScript()` with valid Python code but an invalid file path (e.g., `/invalid_path/test_script.py`).

- c. 1 def greet(name):
 2 if name:

```

3 return 'Hello, ' + name + '!'
4 else:
5 return 'Hello, World!'
6
7 name = 'Deadline Dominators'
8 print(greet(name))

```

- d. Verify if the appropriate error is thrown and handled.

- **Expected Output:**

- An `IOException` should be thrown due to the inability to save the file at the specified location.
- The error should be logged, and no file should be created.

- **Actual Results:**

- The `IOException` was thrown as expected due to the invalid path, and no file was created.

```

1 Stdout:
2
3 Stderr:
4 python3: can't open file '/app/test.py': [Errno 2] No such file or directory
5

```

- **Postconditions:**

- The error is handled gracefully, and no Python file is saved.

- **Result: Pass**

---

### Test Case: IDE-06

- **Test Case Name:** Handling Missing Python Module (NLTK) in Docker Execution

- **Preconditions:**

- Docker is installed and running.
- The Docker image (`python:3.8`) is used for executing the Python script.
- The Python script attempts to import the `nltk` module, but `nltk` is not installed inside the Docker container.

- **Steps:**

- a. Write a Python script (`code.py`) that includes the following:

```

b. 1 import nltk
2 def split_sentence(sentence):
3 words = nltk.word_tokenize(sentence)
4 return words
5
6 sentence = 'This is an example sentence to split.'
7 words = split_sentence(sentence)
8 print(f'Words in the sentence: {words}')

```

- c. Save the script using the `PythonFileWriter` class to `/app/code.py` inside the Docker container.

- d. Execute the saved Python file using the `DockerExecutor` class with the Docker image `python:3.8`.

- e. Capture the standard output (`stdout`) and standard error (`stderr`).

- **Expected Output:**

- The execution fails due to the `nltk` module not being installed.
- The `stderr` should include a `ModuleNotFoundError` for `nltk`.
- The `stdout` should not include any output because the script did not execute successfully.

- **Actual Results:**

- The execution failed as expected due to a missing Python module (`nltk`).

- The following error was captured in the `stderr`:

```
1 Stdout:
2
3 Stderr:
4 WARNING: The requested image's platform (linux/arm64) does not match the detected host platform
(linux/amd64/v3) and no specific platform was requested
5 Traceback (most recent call last):
6 File "/app/code.py", line 1, in <module>
7 import nltk
8 ModuleNotFoundError: No module named 'nltk'
```

- No output was captured in `stdout` as the script did not execute beyond the import statement.

- **Postconditions:**

- The error was correctly logged, indicating that the `nltk` module was not found in the Docker container.
- This result indicates that additional dependencies (like `nltk`) need to be installed in the Docker environment for successful execution.

- **Result: Pass**

# User Feedback Report

**Project Name:** User Interface & Functionality

**Test Document Date:** Oct 25, 2024

**Test By:** @Yan Gong @Jiayi Wang

## User-Test 001 :

### 1. User Background

The user is a Master of Commerce student from the University of Sydney, with foundational knowledge in machine learning. Although they are relatively new to Parson's problems, they expressed an interest in learning data analysis and coding logic through this interactive format.

### 2. Platform User Experience

- **Ease of Use:** The user found the platform's interface clean, well-organized, and user-friendly, allowing for straightforward navigation. The design and layout of features were intuitive, making it easy for users to locate and engage with the platform's functionalities without confusion.
- **Quality and Accuracy of AI-Generated Problems:** The user noted that while the AI-generated problems could be challenging for beginners, the tasks were beneficial for users with a basic understanding of coding or data analysis. This indicates that the difficulty level may not be well-suited for absolute beginners, but it provides valuable practice for those with some prior knowledge, especially in machine learning and logic-based programming.
- **Effectiveness of Feedback Mechanism:** The platform's hint system and explanations were well-received. The user appreciated the immediate, contextually relevant guidance provided, which contributed significantly to their understanding of the material. The quality of feedback was helpful in aiding them to debug code and understand logical errors, fostering a productive learning environment.

### 3. Evaluation of Learning Outcomes

- **Improvement in Understanding of Data Analysis and Machine Learning:** After completing tasks, the user reported a clearer understanding of data analysis and machine learning, indicating that the tasks helped reinforce foundational concepts.
- **Enhancement in Coding Skills:** The platform's tasks effectively improved coding skills, particularly in logic and debugging. The challenging nature of the problems helped develop the user's logical thinking and problem-solving abilities.

### 4. Main Challenges

The primary challenge faced by the user was the level of difficulty presented in some tasks, which they found challenging due to their limited experience with coding. This highlights a potential area for improvement in the platform's adaptability to cater to different levels of proficiency, particularly to offer more introductory exercises for beginner-level users.

### 5. Overall Satisfaction and Suggestions

- **User Satisfaction:** Overall, the user expressed positive feedback about the platform, acknowledging its capacity to assist in learning programming skills. They also expressed a willingness to continue using Codecraft, suggesting that the platform successfully met their educational goals.
- **Suggestions for Platform Improvement:**
  - **Performance Enhancements:** The user noted occasional slowdowns in platform responsiveness. Addressing performance issues could improve the user experience, especially for tasks requiring real-time interaction.

- **Addition of Video Tutorials:** Incorporating video tutorials was suggested as an additional resource for beginners. This would make the platform accessible to a broader range of users by offering guided learning that enhances understanding.

## User-Test 002 :

### 1. User Background

- The user is a Bachelor of Design student from the University of Melbourne without prior programming experience. They are relatively new to Parson's problems and interested in learning foundational coding concepts through the platform.

### 2. Platform User Experience

- **Ease of Use:** The platform interface was easy to navigate, with a clean, user-friendly design. The illustrations and visual elements provided a pleasant and engaging experience, easing the learning process for beginners and reducing the initial intimidation of coding tasks.
- **Quality and Accuracy of AI-Generated Problems:** The user found the difficulty level challenging for beginners, as they struggled to understand the correct order of code segments. This suggests that the platform could benefit from additional beginner-focused tasks or simpler introductory steps that better support those with no coding background.
- **Feedback Mechanism and Guidance:** The feedback offered by the platform was concise and to the point, allowing users to quickly assess their performance and improve task efficiency. However, more in-depth guidance tailored for absolute beginners could further support early learning by clarifying common errors or highlighting logical structures within the code.
- **Product Introduction on Homepage:** The homepage's introduction to platform features was clear and beneficial for orienting new users. This initial overview allowed the user to gain a solid understanding of the product's purpose, easing their entry into tasks and minimizing confusion about the platform's goals.

### 3. Evaluation of User Interface and Experience

- The user valued the visual appeal and simplicity of the platform's interface, particularly as a non-coding beginner. However, they noted that the problem and code generation times were long, leading to interruptions in the learning flow. Improving response time for code generation would significantly enhance user engagement, particularly for those just beginning to explore programming concepts.

### 4. Main Challenges

- The main challenge was the difficulty level of tasks for users without prior coding experience. The user struggled with understanding how to correctly order the code segments, indicating a need for additional introductory problems or guided examples for complete beginners.

### 5. Overall Satisfaction and Suggestions

- **User Satisfaction:** The user appreciated the platform's engaging design and found it a motivating environment for beginners. They expressed interest in continuing to use Codecraft to explore coding fundamentals.
- **Suggestions for Platform Improvement:**
  - **Enhanced Response Time for Code Generation:** Reducing the time required for generating problems and code would improve continuity and minimize disruptions, making it easier for users to maintain focus.
  - **Beginner-Friendly Guidance and Tutorials:** Adding short, structured tutorials or visual aids for entry-level tasks could simplify the learning curve, especially for users with no programming experience. These enhancements would foster an accessible entry point for new learners.

## User-Test 003 :

### 1. User Background

The user is a Bachelor of Design student from the University of Monash with foundational knowledge in UI design. This user has very professional Figma experience and product evaluation ability. The context for this user will focus more on the design of CodeCraft

### 2. Platform User Experience

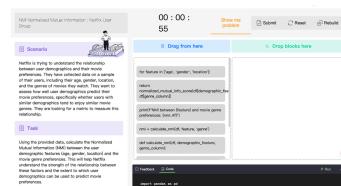
- **Ease of Use:** Users say they like our UI design, which is comparable to a real learning environment. The single line flow across the platform is very clear, and there is no unimplemented or stacked functionality.

Some problems:

- The loading page did not fully cover the problem



- Sometimes code longer than block



- **Quality and Accuracy of AI-Generated Problems:** The overall production is good, but there are problems.

1. Sometimes the Code does not show the problem, only the problem and scene, but no content to do the problem.
  2. Code is sometimes incomplete. Let's say you have a function line def, but the contents of the function don't exist in the block
- **Effectiveness of Feedback Mechanism:** After completing the problem, the platform will return the output result. If it's a mistake, it's incorrect. Correct answers are displayed and output is displayed. The time and number of responses will also be provided after the submission. The whole process is fine

### 3. Evaluation of Learning Outcomes

- Since the user is not a student majoring in computer or data analysis, he has not systematically learned machine learning, NMI, linear algebra and other knowledge, and cannot be evaluated in this aspect. However, the user has a simple python learning experience, he thinks that the content of the code generation does not seem to be wrong, and the correlation between the topic and the code is good.

### 4. Main Challenges

The main challenge lies in ensuring the consistency and completeness of code generation, particularly in aligning problem scenarios with corresponding code solutions and maintaining accuracy across longer code blocks.

### 5. Overall Satisfaction and Suggestions

- **Incomplete loading page coverage:** The loading page cannot completely cover the interface and needs to be optimized to ensure visual consistency during loading.

- **Problem and code display do not match:** Some problems only display scene descriptions without corresponding code content, so the accuracy of the generation logic needs to be improved.
- **Incomplete code block:** Some code blocks lack content, such as only function definition, missing function body, need to ensure the integrity of code generation.
- **Lack of correlation between the code and the problem:** Although the correlation is strong, in some cases the problem and the code do not match exactly, and the matching degree needs to be further improved.

## User-Test 004:

### 1. User Background

The user is a Bachelor of Data Science student from the University of Melbourne with foundational knowledge in UI design. The user has taken Evidence-Oriented Decision Making (EODP) courses before, which equips them to specifically assess the core content of the platform—Parson's problems.

### 2. Platform User Experience

- **Ease of Use:** The platform is user-friendly and intuitive, allowing easy navigation and access to different types of problems. The clear and simple interface is particularly beneficial for beginners in coding.
- **Quality and Accuracy of AI-Generated Problems:** The problems generated by AI are relevant and correctly aligned with the data science curriculum, providing a good mix of difficulty levels to cater to various skill sets.
- **Effectiveness of Feedback Mechanism:** The instant feedback mechanism is efficient, providing users with immediate responses on their code submissions. It helps in identifying mistakes and learning correct coding practices quickly.

### 3. Evaluation of Learning Outcomes

- **Improvement in Understanding of Data Analysis and Machine Learning:** The platform has significantly contributed to enhancing the user's understanding of data analysis techniques and machine learning concepts, ensuring a practical approach to theoretical knowledge.
- **Enhancement in Coding Skills:** Regular practice through the platform has improved the user's coding skills, particularly in Python, which is widely used in data science.

### 4. Main Challenges

The main challenge lies in ensuring that the AI-generated problems are consistently challenging yet achievable to keep the user engaged without causing frustration. Ensuring the relevance and applicability of these problems to real-world data science scenarios is also critical.

### 5. Overall Satisfaction and Suggestions

- **Incomplete Content in Some Problems:** Some of the Parson's problems lack complete blocks or necessary data, which can confuse beginners. It is suggested to review and ensure the completeness of each problem before it is presented to the users.
- **Alignment of Problems With Current Data Science Trends:** To make the learning more applicable, it is suggested to include more problems based on current trends and advancements in data science and machine learning.

## Client Communication

- i Client meetings are held either via zoom or in person.

 Week 3 Client Meeting

 Week 6 Client Meeting

 Week 9 Client Meeting

# Week 3 Client Meeting



Aug 5, 2024



- 003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Rina Zhang @Yan Gong @Yifan ZHANG )



- Let Geela clarify all the questions about product requirements we came up in the last group meeting.



| Question                                                                                                                                                                                                                                                                                                                                                                                                                                    | Answer                                                                                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Is there any budget on ChatGPT API?                                                                                                                                                                                                                                                                                                                                                                                                         | For now we will use free version only (we are encouraged to also have a look at other AI models and see if they perform better than ChatGPT). After the first sprint, we can have a calculation on the cost of using the premium version and let Geela decide if the cost meets her budget. |
| Do we need to have a build-in online compiler for IDE style feedback?                                                                                                                                                                                                                                                                                                                                                                       | In the first sprint we only need to give <u>boolean</u> feedbacks to the users. That is, we don't need a build in compiler for now.                                                                                                                                                         |
| Should we generate a complete code or it can be a third party library such as sklearn to import from it? Example:                                                                                                                                                                                                                                                                                                                           | The code needs to be complete and executable.                                                                                                                                                                                                                                               |
| <pre> 1 # Locate the most similar neighbors 2 def get_neighbors(train, test_row, num_neighbors): 3     distances = [] 4     for train_row in train: 5         dist = euclidean_distance(test_row, train_row) 6         distances.append((train_row, dist)) 7     distances.sort(key=lambda tup: tup[1]) 8     neighbors = [] 9     for i in range(num_neighbors): 10        neighbors.append(distances[i][0]) 11    return neighbors </pre> | <pre> 4 # calculate the Euclidean distance between two points 5 def euclidean_distance(row1, row2): 6     distance = 0.0 7     for i in range(len(row1)-1): 8         distance += (row1[i] - row2[i])**2 9     return sqrt(distance) 10 </pre>                                              |
| Does the product contain sign in function?                                                                                                                                                                                                                                                                                                                                                                                                  | No, at least not for now.                                                                                                                                                                                                                                                                   |
| Do we need to also design mobile phone compatible UI?                                                                                                                                                                                                                                                                                                                                                                                       | Not for now. Could be possible for future extension.                                                                                                                                                                                                                                        |
| Does the product have hint of each problem?                                                                                                                                                                                                                                                                                                                                                                                                 | Not for now.                                                                                                                                                                                                                                                                                |
| Is there any administration account?                                                                                                                                                                                                                                                                                                                                                                                                        | Yes, there needs to be <u>one admin account</u> containing all the functionality of normal students account, plus <u>extra statistical analysis</u> on the performance of how well the student's ability is to complete each module's questions.                                            |

## Action items

- Each group member should have come up with at least one question to ask Geela.
- Complete requirement document. - by Rita

## Key points

 No user sign in required.

 Implement only Boolean feedback for now.

 Use free AI models

# Week 6 Client Meeting

## Date

Aug 26, 2024

## Participants

003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Rina Zhang @Yan Gong @Yifan ZHANG )

## Goals

- Present progress and product demo to Geela
- Ask feedback from Geela

## Discussion topics

| Item                | Presenter | Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Feedback            | Geela     | <ul style="list-style-type: none"><li>In the 'Feedback' section, the 'Accuracy' part should be removed.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Online code library | Geela     | <ul style="list-style-type: none"><li>Geela has suggested that we could find some library that contains relevant codes to be used for parson's problems.</li><li>However, we insisted that all codes should be AI generated. There are two main reasons for this decision:<ol style="list-style-type: none"><li>Using available codes from online library resources can potentially cause students cheating on doing parson's problems, since they can search for the answers online.</li><li>The AI generated questions are already pretty optimal in helping students build their understanding for data processing related coding.</li></ol></li></ul> |

## Action items

- Present entire product to client
- Ask for feedback from client

## Decisions

 Refine Feedback section

 No library resources needed for the parson's problems.

# Week 9 Client Meeting

## 📅 Date

Sep 16, 2024

## 👥 Participants

003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Rina Zhang @Yan Gong @Yifan ZHANG )

## 📝 Goals

- Demonstrate the current progress of product to client
- Seek for feedback
- Ask questions discussed last week

## 🗣 Client Feedback

| Item                                                    | Notes                                                                                                                             |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| AI Model (Currently Gemini)                             | Suggest to change to a better AI model in the future.                                                                             |
| AI generated questions                                  | Questions are consistent to the topics and contexts.                                                                              |
| Admin: 'Time Stamp' and 'Time Taken' need to be clearer | Time Stamp should consist of Generate Time and Submit Time; both Time Stamp and Time Taken need to be more accurate – to seconds. |
| 'Time Stamp' time zone                                  | The time needs to be recorded by developers' end, so that there won't be confusion about different time zones.                    |
| Order of topics                                         | The order of topics should be sorted by order of most recent.                                                                     |
| Prototype design                                        | Great                                                                                                                             |
| General feedback on the current progress                | Great                                                                                                                             |

## ❓ Question & Answer

| Question                                                                                                                                                                                                                                                                                                 | Client's Answer/ Suggestion                                                                                                                                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| When reading CSV files, an error would occur if there is no actual CSV file for IDE to load in the current path, while having each CVS file in the code takes too much space. Therefore, how would you like the CSV reading/writing related problems to be generated by AI?<br><br>3 Possible Solutions: | It's suggested that LLM model should be told not to generate CSV files for topics other than CSV Read/Write. Other detailed implementations should be decided by the development team. |

|                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| <ol style="list-style-type: none"> <li>1. Modify the AI prompt so that the AI generates a relatively small dataset each time.</li> <li>2. Predefine a constant dataset for each context of CSV topic; meanwhile, tell the LLM not to generate any CSV files for other topics.</li> <li>3. After the LLM has generated the CSV files, use Backend to store the CSV file instead of putting it inside the question code.</li> </ol> |                                                      |
| <p>Our concern is that, while the user gives correct answer, the warnings can be confusing. Do we still need to provide the warning to the users even though they have done the question correctly?</p>                                                                                                                                                                                                                           | <p>Yes, please include the IDE warnings as well.</p> |

## ✓ Action items

- Modify 'Time Stamp'

## ⌚ Decisions

 See [Include IDE Warning](#) and [CSV Files Generation](#) for details.

 Generate CSV files for CSV Read/Write topic only; let the backend store the generated CSV file.

 Include warnings in the IDE feedback.

# Deployment Enquiry

## Communication Purpose

To save time when showing the final version of our product to client, we need to make sure that we could find the most efficient way. Thus, one of our developers initiated a communication with our client Geela, enquiring if she has got the technologies required to deploy the product locally.

## Response from Client

Our client stated that she needs get to the technologies installed, which seems inconvenient for her, and could be potentially time-consuming. To make sure that we can present the entire product to client smoothly within the 40-minute time limit, we decided to deploy the product to cloud server. See [3 Sprint 3 Decision Backlog](#) for decision backlog and [Deployment](#) for detailed steps of deployment.

The screenshot shows a communication thread between two users: Jiayi Wang and Geela Chee. The conversation starts with Jiayi Wang asking Geela if she has a MySQL workbench, stating that their platform is not deployed since they don't have it. Geela responds, indicating that she doesn't mind if Jiayi installs things on her local machine, as long as everything is documented well, including dependencies. She also expresses her appreciation for the reply. Jiayi then informs Geela that they will document the requirements if deployment fails. The messages are timestamped, with the first message from Jiayi on Monday, October 21, at 6:35 PM, and the last message from Geela on Tuesday, October 22, at 2:07 PM.

Jiayi Wang  
Hi Geela, Team03 is trying to perfect the final details. We want to ask if you have a MySQL workbench? Our platform is not deployed since we dont need this part

Mon, Oct 21, 6:35 PM (5 days ago) ☆ ↵ :

Geela Chee  
to me ▾  
Hi Jiayi,

Tue, Oct 22, 11:06 AM (4 days ago) ☆ ↵ :

No I don't. That's fine. I am expecting to install a few things to be able to run it myself on my local machine. You just need to ensure that everything is documented well, including dependencies i.e. anything else I need to install before being able to run these other packages etc.

Kind regards,

**Dr. Geela Chee**  
School of Computing and Information Systems | Faculty of Engineering and Information Technology  
The University of Melbourne, Victoria 3010 Australia  
E: [geela.chee@unimelb.edu.au](mailto:geela.chee@unimelb.edu.au)  
...

Jiayi Wang <[jjiawang10@student.unimelb.edu.au](mailto:jjiawang10@student.unimelb.edu.au)>  
to Geela ▾

Tue, Oct 22, 2:07 PM (4 days ago) ☆ ↵ :

Hi Geela,

Got it, thank you for your reply. We decide to try deployment first, if it cannot work, we will document the whole requirements.

Bests,  
Jiayi  
...



## Team Decisions

- ❶ Keeps track of important decision backlogs for each sprint.

[❷ Sprint 2 Decision Backlog](#)

[❸ Sprint 3 Decision Backlog](#)

## 2 Sprint 2 Decision Backlog

| Decision                                                                                                          | Backlog                                    |
|-------------------------------------------------------------------------------------------------------------------|--------------------------------------------|
| 👉 Change IP Address to randomly generated IDs in the Admin->Dashboard page.                                       | <a href="#">Encode IP Addresses</a>        |
| 👉 AI and IDE are developed as independent projects packaged into JAR files, then use database to manage the JARs. | <a href="#">Backend Setup</a>              |
| 👉 Generate CSV files for CSV Read/Write topic only; let the backend store the generated CSV file.                 | <a href="#">CSV Files Generation</a>       |
| 👉 Include warnings in the IDE feedback.                                                                           | <a href="#">Include IDE Warnings</a>       |
| 👉 Indent the code block by clicking on the block.                                                                 | <a href="#">Indentation Implementation</a> |

# Encode IP Addresses

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Status       | COMPLETED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Owner        | @Yifan ZHANG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Contributors | @Yifan ZHANG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Approved     | @Yiru Liu @Howard Li @Jiayi Wang @Yan Gong @Yifan ZHANG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Due date     | Sep 15, 2024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Decision     |  Change IP Address to randomly generated IDs in the Admin->Dashboard page.                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| On this page | <ul style="list-style-type: none"> <li>•  Problem statement</li> <li>•  Research insights</li> <li>•  Solution hypothesis</li> <li>•  Design options</li> <li>•  Follow up</li> </ul> |

## Problem statement

Originally the dashboard shows users' IP addresses to the administrator, then we realized that this could potentially threaten users' privacy. Plus, visible IP addresses violate our goal of allowing users to use our product anonymously. Therefore, showing users' IP addresses in the dashboard is an inappropriate decision.

## Research insights

Research indicates that an IP address is a personal information since it is an information about identifiable individual associated with them, meaning that IP addresses are part of users' privacy which shouldn't be exposed to others.

## Solution hypothesis

Hide the IP addresses in the dashboard by a user ID.

## Design options

|                           |           | Option 1                                                                                                                                                                                                                                   | Option 2                                                                                                     |
|---------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| <b>Overview</b>           |           | Change the IP addresses to corresponding nicknames picked by users.                                                                                                                                                                        | Let the database generate random IDs for users to hide their IP addresses.                                   |
| <b>Benefits and risks</b> |           |  Protect users' privacy.<br> Hard to detect any offensive nicknames. |  Protect users' privacy. |
| <b>Criteria</b>           | Resources | No cookies available (need cookies to record nickname; otherwise a user might have to pick a nickname on every entry)                                                                                                                      | Database is already available                                                                                |
|                           | Existence | Medium                                                                                                                                                                                                                                     | High                                                                                                         |

|  |                              |      |      |
|--|------------------------------|------|------|
|  | Ability to Hide IP Addresses | High | High |
|--|------------------------------|------|------|

Follow up

| Decision                                                        | Status  |
|-----------------------------------------------------------------|---------|
| Let database to generate random and unique IDs each IP address. | DECIDED |
| Change the IP addresses to IDs in dashboard.                    | DECIDED |

# CSV Files Generation

|              |                                                                                                                                                                                       |
|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Status       | COMPLETE                                                                                                                                                                              |
| Owner        | @Yan Gong                                                                                                                                                                             |
| Contributors | @Yan Gong                                                                                                                                                                             |
| Approved     | 003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Yan Gong @Yifan ZHANG )                                                                                                  |
| Due date     | Sep 18, 2024                                                                                                                                                                          |
| Decision     | Generate CSV files for CSV Read/Write topic only; let the backend store the generated CSV file.                                                                                       |
| On this page | <ul style="list-style-type: none"> <li>•  Problem statement</li> <li>•  Research insights</li> <li>•  Solution hypothesis</li> <li>•  Design options</li> <li>•  Follow up</li> </ul> |

## ❓ Problem statement

Problem in CSV Read/Write: Originally no CSV files are required to be loaded. however, when reading CSV files, an error would occur if there is no actual CSV file for IDE to load in the current path.

## 💡 Research insights

There has to be actual CSV to be uploaded in the IDE in order to make the IDE return desired output.

## 📊 Solution hypothesis

Define a different AI prompt for CSV Read/Write topic than other topics.

## 🌈 Design options

|                    | Option 1                                                                                                                                                                                                      | Option 2                                                                                                                                                                                                                                          | Option 3                                                                                                                                                                                                                                                               |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overview           | Modify the AI prompt so that the AI generates a relatively small dataset each time. Put the entire dataset in one block of code in the drag and drop section.                                                 | Predefine a constant dataset for each context of CSV topic; meanwhile, tell the LLM not to generate any CSV files for other topics.                                                                                                               | <ol style="list-style-type: none"> <li>Ask the AI to not generate any CSV files for topics other than CSV Read/Write.</li> <li>After the LLM has generated the CSV files, use Backend to store the CSV file instead of putting it inside the question code.</li> </ol> |
| Benefits and risks | <p> Enables the IDE to give correct output.</p> <p> There is a still large block of code in the question page, which takes too much spaces and could potentially make the product less convenient to use.</p> | <p> Avoids errors like cannot read files in the current path.</p> <p> Avoids the risk of having a very large block code for the dataset.</p> <p> Make the questions less interesting and limit the variability of the AI generated questions.</p> | <p> Avoids errors like cannot read files in the current path.</p> <p> Avoids the risk of having a very large block code for the dataset.</p> <p> Preserves the variability of AI generated questions.</p>                                                              |

|                 |                                                   |      |         |      |
|-----------------|---------------------------------------------------|------|---------|------|
| <b>Criteria</b> | Correct IDE Output                                | Yes  | Yes     | Yes  |
|                 | Efficiency of Reducing Size of Block              | Low  | High    | High |
|                 | Ability to Make AI Generate Interesting Questions | High | Limited | High |

## Follow up

| Decision                                                                       | Status  |
|--------------------------------------------------------------------------------|---------|
| Ask the AI to not generate any CSV files for topics other than CSV Read/Write. | DECIDED |
| Use Backend to store the generated CSV file for each question.                 | DECIDED |

# Include IDE Warnings

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Status       | COMPLETED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Owner        | @Yan Gong                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Contributors | @Yan Gong @Howard Li                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Approved     | 003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Yan Gong @Yifan ZHANG )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Due date     | Sep 20, 2024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Decision     |  Include warnings in the IDE feedback.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| On this page | <ul style="list-style-type: none"><li>•  Problem statement</li><li>•  Research insights</li><li>•  Solution hypothesis</li><li>•  Design options</li><li>•  Follow up</li></ul> |

## Problem statement

While the user gives correct answer, the warnings can be confusing. Is it necessary to provide the warning to the users even though they have done the question correctly?

## Research insights

Warnings can be given even though the code are put in the correct order and IDE has returned the correct output.

Warning Example:

Previously, `mean_squared_error` had a `squared` parameter. If `squared=True`, it would return the mean squared error (MSE); if `squared=False`, it would return the root mean squared error (RMSE).

The `squared` parameter will no longer be used in future versions, and instead, you should use the new function `root_mean_squared_error` directly when you want RMSE.

Previously, `mean_squared_error` had a `squared` parameter. If `squared=True`, it would return the mean squared error (MSE); if `squared=False`, it would return the root mean squared error (RMSE).

The `squared` parameter will no longer be used in future versions, and instead, you should use the new function `root_mean_squared_error` directly when you want RMSE.

## Solution hypothesis

Users may find the warnings confusing. Thus, it's crucial to not let them get confused.

## Design options

|                    |                                                       | Option 1                                                                                                                                                                                                                             | Option 2                                                                                                                                                                                                                                                                                                                                                            | Option 3                                                                                                                                                                                                                                                      |
|--------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overview           |                                                       | Remove every warning given by IDE.                                                                                                                                                                                                   | Remove only non-significant warnings.                                                                                                                                                                                                                                                                                                                               | Keep all warnings.                                                                                                                                                                                                                                            |
| Benefits and risks |                                                       | <ul style="list-style-type: none"> <li>+ Will not make the users confused about their correctness.</li> <li>- Risk losing the ability to return authentic IDE output.</li> <li>- Risk of making the IDE less informative.</li> </ul> | <ul style="list-style-type: none"> <li>+ Will make the users concerned a bit about their correctness.</li> <li>- Risk losing the ability to return authentic IDE output.</li> <li>- Risk of making the IDE less informative.</li> <li>- Ambiguous to decide which warnings to be ignored; also, involving more time for users awaiting for the feedback.</li> </ul> | <ul style="list-style-type: none"> <li>+ Ensures user to receive an authentic and informative IDE feedback.</li> <li>- Users receiving IDE warnings can be panic about doing the questions wrong, even though they have done them correctly.</li> </ul>       |
| Criteria           | Risk of Getting Users Worried About Their Correctness | Low                                                                                                                                                                                                                                  | Medium                                                                                                                                                                                                                                                                                                                                                              | <p>Medium</p> <p>(Justification: Initially it was regarded as high, then we sought opinion from others, and have concluded that users turned out to trust the correctness feedback more than the IDE output feedback. Thus this concern can be lessened.)</p> |
|                    | Possibility of Success for Our Team to Implement      | High                                                                                                                                                                                                                                 | Medium                                                                                                                                                                                                                                                                                                                                                              | High                                                                                                                                                                                                                                                          |

## Follow up

| Decision                                                 | Status  |
|----------------------------------------------------------|---------|
| Do not have any modification on the IDE output feedback. | DECIDED |

# Indentation Implementation

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Status       | COMPLETED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Owner        | @Howard Li                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Contributors | @Howard Li @Jiayi Wang @Yiru Liu                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Approved     | 003 - Deadline Dominators (@Yiru Liu) @Howard Li @Jiayi Wang @Yan Gong @Yifan ZHANG )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Due date     | Sep 21, 2024                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Decision     |  Indent the code block by clicking on the block.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| On this page | <ul style="list-style-type: none"> <li>•  Problem statement</li> <li>•  Research insights</li> <li>•  Solution hypothesis</li> <li>•  Design options</li> <li>•  Follow up</li> </ul> |

## ?

### Problem statement

In the 'Drop blocks here' area, the original proposed way of indentation is to drag the code directly into the correct place, similar to the one would look like in an IDE. However, due to limited resources, we are currently unable to implement the ideal way. Thus, we are thinking of another easy-to-use way to implement the indentation.

## 💡

### Research insights

Intuitively one indentation can be done by moving (dragging) the block of code to the right in a drag and drop practice.

## 📊

### Solution hypothesis

Since we cannot make user to drop the code directly on the ideal indented position, we can let them have one indentation on a certain block of code per indentation, once they have put this block onto the 'Drop blocks here' area.

## 🌈

### Design options

|          | Option 1                                                                                                                                                                                                                                                    | Option 2                                                                                                                                                                                                                                                            |
|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overview | <p>After putting the code onto the 'Drop Blocks here' area, use the mouse to drag the code blocks to the right to make the indentation. Dragging to the right once will make one indentation. Drag the code to the left once to cancel one indentation.</p> | <p>After putting a bloc onto the 'Drop blocks here' area, make the code indented by clicking on the code. There are at most 4 levels of indentations allowed. Clicking the code for the 5th time will make it return to the original point with no indentation.</p> |
| Link     | <a href="#">Rearrange Code Practice Problem in C++ (codechef.com)</a>                                                                                                                                                                                       |                                                                                                                                                                                                                                                                     |

|                           |                        |                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                |
|---------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Benefits and risks</b> |                        | <p>⊕ More Intuitive<br/>⊖ Technical issues disabling the proposed way of 'undoing the indentation by dragging the code to the left' to work.<br/>⊖ So far, users can undo the indentation only by putting the block back on 'Drag from here' area, which reduced the degree of easy-to-use.</p> | <p>⊕ Implementable<br/>⊕ The way of undoing the indentation is more convenient than the one in Option 1.<br/>⊖ Users might not be familiar with the way to do indentation.</p> |
| <b>Criteria</b>           | Easy To Use            | Have indentation: High<br><br>Undo indentation: Very Low                                                                                                                                                                                                                                        | Have indentation: Medium to High<br><br>Undo indentation: Medium to High                                                                                                       |
|                           | Technically Realizable | Medium                                                                                                                                                                                                                                                                                          | High                                                                                                                                                                           |
|                           | Intuitive              | Have indentation: High<br><br>Undo indentation: Very Low                                                                                                                                                                                                                                        | Medium                                                                                                                                                                         |

## ✓ Follow up

| Decision           | Status  | Next steps                                                                                      |
|--------------------|---------|-------------------------------------------------------------------------------------------------|
| Implement Option 2 | DECIDED | <input type="checkbox"/> Specify the instruction on how to do/undo indentation on the homepage. |

# Backend Setup

|              |                                                                                                                          |
|--------------|--------------------------------------------------------------------------------------------------------------------------|
| Status       | COMPLETED                                                                                                                |
| Owner        | @Howard Li                                                                                                               |
| Contributors | @Howard Li                                                                                                               |
| Approved     | 003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Yan Gong @Yifan ZHANG )                                     |
| Due date     | Sep 16, 2024                                                                                                             |
| Decision     | <p>👉 AI and IDE are developed as independent projects packaged into JAR files, then use database to manage the JARs.</p> |
| On this page | <ul style="list-style-type: none"> <li>• 🌈 Design options</li> <li>• ✅ Follow up</li> </ul>                              |

## 🌈 Design options

|                           |                             | Option 1                                                                                                                                                                                            | Option 2                                                                                                                                                                                            |
|---------------------------|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Overview</b>           |                             | Monolithic Architecture: AI and IDE functionalities are combined into a single Maven project. The entire application is packaged into one JAR or WAR file for deployment.                           | AI and IDE are developed as independent projects. Each project is packaged into its own JAR file using Maven. Then, utilizes Maven POM files indexed in the database to manage and access the JARs. |
| <b>Benefits and risks</b> |                             | <ul style="list-style-type: none"> <li>➕ Managing one JAR/WAR simplifies the build pipeline.</li> <li>➖ Scalability limitations.</li> <li>➖ Tighter coupling: interdependent components.</li> </ul> | <ul style="list-style-type: none"> <li>➕ Modularity and separation of concerns</li> <li>➕ Independent deployment and scaling.</li> <li>➖ Increased complexity in build and deployment.</li> </ul>   |
| <b>Criteria</b>           | Modularity                  | Low                                                                                                                                                                                                 | High - clear separation between AI and IDE                                                                                                                                                          |
|                           | Maintainence and Extensions | Easier for large teams – independent updates                                                                                                                                                        | Can be challenging as the codebase grows                                                                                                                                                            |
|                           | Scalability                 | Low                                                                                                                                                                                                 | High - Components can be scaled independently.                                                                                                                                                      |

## ✅ Follow up

| Decision                                    | Status  |
|---------------------------------------------|---------|
| Package AI and IDE into separate JAR files. | DECIDED |

Index AI and IDE Maven POM files in the database.

DECIDED

## 3 Sprint 3 Decision Backlog

 The backlogs keep each Sprint 3 key decision's discussion and evaluation. Click the links below for details.

| Decision                                                                                                                               | Backlog                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
|  Remove completeness bar.                             | <a href="#"> Remove Completeness Bar</a>      |
|  Show product Live Demo in presentation.              | <a href="#"> Present Live Demo</a>            |
|  Focus on product testing, both automated and manual. | <a href="#"> Automated and Manual Testing</a> |
|  Add 'Hint' in question page.                         | <a href="#"> Add Hint</a>                     |

# Remove Completeness Bar

|              |                                                                                                                                                                  |
|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Status       | COMPLETED                                                                                                                                                        |
| Contributors | @Howard Li @Yifan ZHANG                                                                                                                                          |
| Approved     | 003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Rina Zhang @Yan Gong<br>@Yifan ZHANG )                                                              |
| Due date     | Oct 14, 2024                                                                                                                                                     |
| Decision     | Remove completeness bar.                                                                                                                                         |
| On this page | <ul style="list-style-type: none"><li>Problem statement</li><li>Research insights</li><li>Solution hypothesis</li><li>Design options</li><li>Follow up</li></ul> |

## ❓ Problem statement

Originally the team decided to have a completeness bar on each context, where it indicates the percentage of completed questions out of 40 questions. However, some of developers think that this completeness bar may be confusing.

Also, the IP address of one device could be changing. Thus, without logging in, students may lose their progress record.

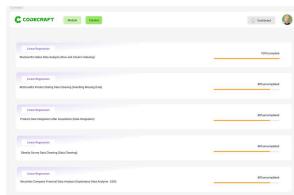
## 💡 Research insights

40 questions for each context may be too much. Based on sending questionnaire to 5 students asking the number of coding questions they are willing to do, students tend to do at most 15 questions per day.

## 📊 Solution hypothesis

Remove the completeness bar and the relevant data.

## 🌈 Design options

|            | Option 1                                                                                   | Option 2                                                                              |
|------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| Overview   | Keep the completeness bar for each context (percentage of completeness question out of 40) | Remove the completeness bar.                                                          |
| Screenshot |         |  |

| Link                      |                      | <a href="#">Week 10 Scrum Meeting Notes   ↗ Decision</a><br>S                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <a href="#">Week 11 Scrum Meeting   ↗ Decisions</a>                                                                                                                                                                                                                     |
|---------------------------|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Benefits and risks</b> |                      | <ul style="list-style-type: none"> <li>+ Encourage students to do more questions.</li> <li>+ Give users the information about how much they have done for each context.</li> <li>- Users can be confused about the completeness bar - decreasing the level of easy-to-use.</li> <li>- Without logging in, IP address is varying - such that the record of completeness is not accurate.</li> <li>- Potential risk of overwhelming the students with such great amount of questions to fulfill the completeness bar (i.e. Students need to do at least <math>40 \times 5 \times 7 = 1400</math> questions).</li> </ul> | <ul style="list-style-type: none"> <li>+ The layout is more concise.</li> <li>+ Do not have to explain the use of 'Completeness' bar.</li> <li>+ No risk of losing completeness record.</li> <li>- Have the risk of losing encouragement of doing questions.</li> </ul> |
| Criteria                  | Level of easy-to-use | Medium - Students may have to find information of what the completeness bar is about.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | High - Clearer layout.                                                                                                                                                                                                                                                  |
|                           | Security             | Low - No guarantee in saving progress.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | High - No risk of experiencing loss in progress.                                                                                                                                                                                                                        |
|                           | Level of informative | Medium - Though the students may find it useful recording the progress of completing, they could still experience the loss in progress due to unexpected change in IP addresses.                                                                                                                                                                                                                                                                                                                                                                                                                                      | Medium - Users are not provided with the information of how far they go on each context.                                                                                                                                                                                |

## ✓ Follow up

| Decision                     | Status  | Next steps                                                                        |
|------------------------------|---------|-----------------------------------------------------------------------------------|
| Remove the completeness bar. | DECIDED | <input checked="" type="checkbox"/> Review with client in the final presentation. |

# Present Live Demo

|              |                                                                                                                                                                                  |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Status       | COMPLETED                                                                                                                                                                        |
| Contributors | @Howard Li @Yifan ZHANG @Yiru Liu                                                                                                                                                |
| Approved     | 003 - Deadline Dominators (@Yiru Liu) @Howard Li @Jiayi Wang @Rina Zhang @Yan Gong<br>(@Yifan ZHANG )                                                                            |
| Due date     | Oct 14, 2024                                                                                                                                                                     |
| Decision     | 👉 Show product Live Demo in presentation.                                                                                                                                        |
| On this page | <ul style="list-style-type: none"> <li>❓ Problem statement</li> <li>💡 Research insights</li> <li>📊 Solution hypothesis</li> <li>🌈 Design options</li> <li>✅ Follow up</li> </ul> |

## ❓ Problem statement

In the presentation preparation, originally we were unsure about whether to show the product through recorded video + voice over or live demo.

## 💡 Research insights

- In the sample presentation, the students used recorded videos to demonstrate their products.
- However, the recorded video can be potentially problematic.

## 📊 Solution hypothesis

- Use live demo instead of recorded video.
- This could be more interesting, more engaging, and more informative.

## 🌈 Design options

|                    |                                                            | Option 1                                                                                                                                                                                                                                                                                                                                                                                                       | Option 2                                                                                                                                                                                                                                                                                                                  |
|--------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overview           |                                                            | Show product through the form of recorded video + voice over.                                                                                                                                                                                                                                                                                                                                                  | Illustrative the product lively during presentation.                                                                                                                                                                                                                                                                      |
| Link               |                                                            | <a href="#">Week 10 Work Allocation Meeting   ↴ Decisions</a><br><a href="#">↳ DDE3 Discussion topics</a>                                                                                                                                                                                                                                                                                                      | <a href="#">Week 11 Scrum Meeting   ↪ Decisions</a>                                                                                                                                                                                                                                                                       |
| Benefits and risks |                                                            | <ul style="list-style-type: none"> <li>+ Less prone to the danger of unexpected issues, such as having prolonged loading time of AI generation.</li> <li>+ No risk of getting the presenter nervous of showing the product.</li> <li>- Loss of engagement in presentation.</li> <li>- Loss of the level of convincing.</li> <li>- Client had highly recommended to present the product demo lively.</li> </ul> | <ul style="list-style-type: none"> <li>+ Making the presentation more engaging and persuasive.</li> <li>+ Fulfill the client's requirements.</li> <li>+ A good encouragement for our developers to do more testing to ensure we can catch issues early.</li> <li>- Could be exposed to some unexpected issues.</li> </ul> |
| Criteria           | Convincing the audiences that the required functionalities | Medium - Since video is pre-recorded, accessors could wonder if there are some defects in our product that we can cut off.                                                                                                                                                                                                                                                                                     | High                                                                                                                                                                                                                                                                                                                      |

|  |                                              |                                                            |      |
|--|----------------------------------------------|------------------------------------------------------------|------|
|  | have been implemented.                       |                                                            |      |
|  | Encouraging product testing and refinements. | Medium                                                     | High |
|  | Entertainment in presentation                | Medium - Pre-recorded videos can be duller than live demo. | High |

## ✓ Follow up

| Decision                                    | Status  | Next steps                                                                                                                                                                                                                       |
|---------------------------------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Present the product lively in presentation. | DECIDED | <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Carefully do more testing before the presentation.</li> <li><input checked="" type="checkbox"/> Live Demo presenters should practice more.</li> </ul> |

# Automated and Manual Testing

|              |                                                                                                                                                                                  |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Status       | IN PROGRESS                                                                                                                                                                      |
| Contributors | @Yifan ZHANG @Yan Gong @Jiayi Wang                                                                                                                                               |
| Approved     | 003 - Deadline Dominators (@Yiru Liu @Howard Li @Jiayi Wang @Yan Gong @Yifan ZHANG )                                                                                             |
| Due date     | Oct 28, 2024                                                                                                                                                                     |
| Decision     | 👉 Focus on product testing, both automated and manual.                                                                                                                           |
| On this page | <ul style="list-style-type: none"> <li>❓ Problem statement</li> <li>💡 Research insights</li> <li>📊 Solution hypothesis</li> <li>🌈 Design options</li> <li>✅ Follow up</li> </ul> |

## ❓ Problem statement

Need of reducing the risk of occurring errors in our product; ensure that every requirement has been fulfilled and our product is on the right track.

## 💡 Research insights

We need to test both functional requirements and non-functional requirements.

## 📊 Solution hypothesis

Do lots of both manual and automatic testing.

## 🌈 Design options

|                    | Option 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Option 2                                                                                                                                                                                                                                                                                | Option 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overview           | Only some manual testing by reviewing each page several times                                                                                                                                                                                                                                                                                                                                                                                                                              | Only automated testing                                                                                                                                                                                                                                                                  | Both automated and manual testing                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Link               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                         | <a href="#">Week 11 Scrum Meeting   ↗ Decisions</a>                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Benefits and risks | <ul style="list-style-type: none"> <li>+ Less time consuming - developers have more time to implement more functionalities.</li> <li>+ Some guarantee in user experience.</li> <li>- Undetected bugs and errors.</li> <li>- Vulnerable security and performance.</li> <li>- Unreliable features, such as code being irrelevant to generated question.</li> <li>- It is not necessary to implement non-required functionalities, such as the proposed 'adding completeness bar'.</li> </ul> | <ul style="list-style-type: none"> <li>+ Fast and efficient execution.</li> <li>+ Eliminate human errors during repetitive tasks.</li> <li>+ Very scalable to handle large volume of tests.</li> <li>- No guarantee in user experience.</li> <li>- High initial setup costs.</li> </ul> | <ul style="list-style-type: none"> <li>+ Comprehensive coverage - Automated testing handles repetitive and large-scaled tests; Manual testing handles exploratory and edge-case scenarios where requires human intuition.</li> <li>+ Ensures both efficiency and speed.</li> <li>+ Cost-effective: combining the benefits of handling repetitive tasks and allowing flexibility and adaptability.</li> <li>+ Great for error detection.</li> <li>- Time consuming.</li> </ul> |

|                 |                                        |        |        |      |
|-----------------|----------------------------------------|--------|--------|------|
| <b>Criteria</b> | Validating functional requirements     | Low    | High   | High |
|                 | Validating non-functional requirements | Medium | Low    | High |
|                 | Opportunity cost of time               | Low    | Medium | High |
|                 | Guaranteeing User Experience           | Medium | Low    | High |

## ✓ Follow up

| Decision                                   | Status  | Next steps                                                |
|--------------------------------------------|---------|-----------------------------------------------------------|
| Work on both manual and automated testing. | DECIDED | <input type="checkbox"/> Write summary of testing report. |

## Add Hint

|              |                                                                                                                                                                                  |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Status       | COMPLETED                                                                                                                                                                        |
| Contributors | @Yan Gong @Howard Li                                                                                                                                                             |
| Approved     | 003 - Deadline Dominators (@Yiru Liu) @Howard Li @Jiayi Wang @Rina Zhang @Yan Gong<br>(@Yifan ZHANG )                                                                            |
| Due date     | Oct 14, 2024                                                                                                                                                                     |
| Decision     | 👉 Add 'Hint' in question page.                                                                                                                                                   |
| On this page | <ul style="list-style-type: none"> <li>❓ Problem statement</li> <li>💡 Research insights</li> <li>📊 Solution hypothesis</li> <li>🌈 Design options</li> <li>✅ Follow up</li> </ul> |

### ❓ Problem statement

We are discussing whether having a 'Hint' section in the question page is more beneficial than not.

### 💡 Research insights

The hint could help beginners improve their coding, as well as their confidence in solving problems.

### 📊 Solution hypothesis

- At the process of AI generating questions, it will also generate the corresponding hint for each question. Then, the students can choose to view the hint or close the hint based on their preferences.

### 🌈 Design options

|            | Option 1                               | Option 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------|----------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overview   | Do not have hint on the question page. | Have a collapsible hint section that is pre-generated by AI.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Screenshot |                                        |  <pre> import pandas as pd from sklearn.linear_model import LinearRegression from sklearn.model_selection import train_test_split from sklearn.metrics import mean_squared_error  advertising = pd.read_csv('advertising.csv') X = advertising[['TV', 'Radio', 'Newspaper']] y = advertising['Sales']  X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.3, random_state=42)  model = LinearRegression() model.fit(X_train, y_train) y_pred = model.predict(X_test)  mean_squared_error(y_test, y_pred) </pre> <p>Hint: Click here to get the hint.</p> |
| Link       |                                        | <a href="#">Week 10 Scrum Meeting Notes   ↗ Decision</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

|                           |                          |                                                                                                                                        |                                                                                                                                                            |
|---------------------------|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Benefits and risks</b> |                          | <span style="color: green;">+ Save time in loading a new question.</span><br><span style="color: red;">- Not beginner-friendly.</span> | <span style="color: green;">+ Increase the confidence and efficiency in practice coding.</span><br><span style="color: red;">- Longer loading time.</span> |
| <b>Criteria</b>           | Increase in loading time | None                                                                                                                                   | A comparatively small amount - since generating question will take the majority of time comparing with generating hint.                                    |
|                           | Easy-To-Use              | Medium                                                                                                                                 | High                                                                                                                                                       |
|                           | Beginner-friendly        | Low                                                                                                                                    | High                                                                                                                                                       |

## ✓ Follow up

| Decision                                           | Status  | Next steps                                                                                                                                                                                                                                                                                 |
|----------------------------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Add a collapsible 'Hint' section in question page. | DECIDED | <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Modify the AI prompt so that the hint can be generated at the same process of generating question.</li> <li><input checked="" type="checkbox"/> Modify the Frontend to include the collapsible Hint.</li> </ul> |

# Final Product - Deployment

|              |                                                                                                                                                                                  |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Status       | COMPLETED                                                                                                                                                                        |
| Contributors | @Yifan ZHANG @Yan Gong @Jiayi Wang                                                                                                                                               |
| Approved     | 003 - Deadline Dominators (@Yiru Liu) @Howard Li @Jiayi Wang @Rina Zhang @Yan Gong @Yifan ZHANG )                                                                                |
| Due date     | Nov 1, 2024                                                                                                                                                                      |
| Decision     | 👉 Deploy the product on server to show client.                                                                                                                                   |
| On this page | <ul style="list-style-type: none"> <li>❓ Problem statement</li> <li>💡 Research insights</li> <li>📊 Solution hypothesis</li> <li>🌈 Design options</li> <li>✅ Follow up</li> </ul> |

## ❓ Problem statement

We realized that showing CodeCraft by letting the client to deploy on her computer locally is time-consuming and could get into some unexpected problems.

## 💡 Research insights

There are free cloud servers like AWS available for us to use.

## 📊 Solution hypothesis

The final product can be presented to the client as a website by deploying it on cloud server.

## 🌈 Design options

|                    |                                   | Option 1                                                                                                                                                                                                                               | Option 2                                                                                                                                                                                                                  |
|--------------------|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overview           |                                   | Showing final product as localhost demo                                                                                                                                                                                                | Showing final product using website deployment                                                                                                                                                                            |
| Link               |                                   |                                                                                                                                                                                                                                        | <a href="http://54.252.5.239/">http://54.252.5.239/</a>                                                                                                                                                                   |
| Benefits and risks |                                   | <ul style="list-style-type: none"> <li>+ Complete control for the client</li> <li>+ Local data security</li> <li>- Complex setup on the client's machine</li> <li>- Different local environment may causes different effect</li> </ul> | <ul style="list-style-type: none"> <li>+ Customers can use the deployed website directly</li> <li>+ Make the product more integrated</li> <li>- Security after deployment</li> <li>- Hidden problems need test</li> </ul> |
| Criteria           | Efficiency of showing the product | Low                                                                                                                                                                                                                                    | High                                                                                                                                                                                                                      |
|                    | Integrity of product              | Medium                                                                                                                                                                                                                                 | High                                                                                                                                                                                                                      |

 Follow up

| Decision                                   | Status    | Next steps                                                                                                             |
|--------------------------------------------|-----------|------------------------------------------------------------------------------------------------------------------------|
| Use AWS cloud to deploy CodeCraft platform | COMPLETED | <input type="checkbox"/> Test hidden problems(e.g. Using time for generated problem, data write permission on server ) |

# Deployment

## Main Contributors

@Yifan ZHANG @Yan Gong

## Website Address

<http://54.252.5.239/>

## Overview

CodeCraft was deployed by configuring Nginx as a static file server for the frontend, setting up the backend with a JAR file that auto-starts via `systemd`, and managing Docker for updating containerized parts of the application. The virtual machine runs all the necessary software such as JDK and MySQL to support the deployment. Below records the detailed steps of deployment.

## Deployment Steps

### 1. AWS Server

The development team rented an AWS server and set up a remote virtual machine (VM) on it. This VM acts as the server for hosting both the backend and frontend of the application.

```
1 sudo apt update
2 sudo apt install openjdk-17-jdk // install JDK 17
3 sudo apt install mysql-server // install MySQL
4 sudo apt install nodejs npm // install Node.js
5 sudo apt install docker.io // install docker
```

### 2. Backend Deployment

- The backend was packaged into a JAR file and deployed on the virtual machine.
- To ensure the backend starts automatically after a reboot, a `systemd` service file was created. This file points to the JAR file and manages the automatic startup of the backend.

```
• 1 ./mvnw clean package -DskipTests
 2 scp -i /path/to/your-key.pem /path/to/yourApp.jar ubuntu@your-ec2-public-ip:/home/ubuntu/
 3 sudo nano /etc/systemd/system/name.service
 4 sudo systemctl daemon-reload
 5 sudo systemctl enable name
```

### 3. Frontend Deployment

- The frontend was bundled into a `dist` folder and also deployed to the virtual machine.
- **Nginx** was configured as a static file server to host the frontend files. It handles user requests by serving the frontend and forwarding API requests to the backend.

```
• 1 npm run build
 2 scp -r dist/* user@server-ip:/var/www/html
 3 sudo apt install nginx
 4 sudo nano /etc/nginx/sites-available/default
 5 sudo systemctl restart nginx
```

## 4. Docker Usage

- The project includes a Docker image, which can be updated by pulling the latest version using the command:

```
1 bash
```

Copy code

```
docker pull rita6667/gemini-app:latest
```

This ensures the most recent Docker image is running on the server.

## 5. Additional Software Installation

- JDK 17** was installed on the virtual machine to allow the JAR file (backend) to run.
- MySQL** was also installed to act as the database for the application.

## Deployment Details

### Database

To create the database and table structure using the provided SQL script:

```
1 CREATE DATABASE Parsons_data_db;
2 USE Parsons_data_db;
3
4 -- Create table for user data
5 CREATE TABLE `user_data` (
6 `id` int NOT NULL AUTO_INCREMENT,
7 `ip_address` varchar(45) NOT NULL,
8 `correctness` tinyint(1) NOT NULL,
9 `topic_category` varchar(50) DEFAULT NULL,
10 `duration` time DEFAULT NULL,
11 `contexts` varchar(100) DEFAULT NULL,
12 `generate_time` timestamp NULL DEFAULT CURRENT_TIMESTAMP,
13 `submit_time` timestamp NULL DEFAULT CURRENT_TIMESTAMP,
14 PRIMARY KEY (`id`)
15) ENGINE=InnoDB AUTO_INCREMENT=59 DEFAULT CHARSET=utf8mb4 COLLATE=utf8mb4_0900_ai_ci;
16
17 -- Create table for topics
18 CREATE TABLE topic (
19 id INT AUTO_INCREMENT PRIMARY KEY,
20 topic_title VARCHAR(200) NOT NULL UNIQUE,
21 topic_description TEXT NOT NULL
22);
23
24 -- Create table for contexts
25 CREATE TABLE contexts (
26 id INT AUTO_INCREMENT PRIMARY KEY,
27 context_title VARCHAR(200) NOT NULL,
28 topic_title VARCHAR(200) NOT NULL,
29 CONSTRAINT fk_topic FOREIGN KEY (topic_title) REFERENCES topic(topic_title) ON DELETE CASCADE
30);
```

# Deployment Plan

## Infrastructure Overview

**Frontend:** Vue.js application

### Backend:

- Gemini AI (Will switch to ChatGPT in Sprint 3): An AI service to generate coding questions
- IDE: Configuring Python environment
- Database: for storing users' data (eg. question correctness) and topics & contexts.

### Hosting:

- Frontend: Deployed on a web server (can be hosted on a cloud service like AWS S3, Netlify, or a virtual private server).
- Backend: Deployed on cloud infrastructure (AWS EC2, Google Cloud, or Azure).
- Database: Cloud-managed database services or self-hosted options.

## Infrastructure Choices

| Component      | Technology/Tool                     | Hosting Option                              |
|----------------|-------------------------------------|---------------------------------------------|
| Frontend       | Vue.js                              | Netlify, AWS S3 + CloudFront                |
| Backend        | Gemini AI (Custom API) + IDE        | AWS EC2, Google Cloud, Azure                |
| Database       | MySQL                               | AWS RDS, Google Cloud SQL, or MongoDB Atlas |
| Web Server     | Nginx (for serving the frontend)    | Virtual Machine (EC2 or VPS)                |
| CI/CD Pipeline | GitHub Actions, GitLab CI, CircleCI | Automate Deployment                         |

# Product Presentation

## Agenda

- Arrange the structure of presentation
- Assign suitable parts to each development team member
- Design the presentation in an interesting & entertaining way
- Practice presentation several times with timer.
- Presentation is on [Oct 14, 2024](#)

## Presentation Preparation Meetings

| Date         | Topic                                                                                        | Meeting Record                                         |
|--------------|----------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Oct 5, 2024  | Draft Version Of Presentation<br>Slides & Structure                                          | <a href="#">Week 10 Work Allocation Meeting</a>        |
| Oct 7, 2024  | Update The Structure and Content                                                             | <a href="#">Week 11 Scrum Meeting</a>                  |
| Oct 9, 2024  | Assign presentation parts evenly to each developer                                           | <a href="#">Week 11 Work Allocation Meeting</a>        |
| Oct 12, 2024 | Ensure proper timing and check if there are anything on the rubric that we forgot to mention | <a href="#">Week 11 Group Practice of Presentation</a> |

## Tips for a great presentation

- Entertaining elements.
- Concise language and timing management.
- Visually appealing PowerPoint slides.
- Use discipline-specific languages.
- Use clear voice and make eye-contacts.
- Spend adequate time on Product Demonstration.

## Presentation Guideline

| Topic                 | Notes                                                                                                                                                                                   |
|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Interesting Opening   | <p>@Yifan ZHANG Will act as a EODP student who has trouble in coding.</p> <p>@Yiru Liu Will act as a product promoter and introduce the featured functions of the product to Yifan.</p> |
| Engaging presentation | <ul style="list-style-type: none"><li>• Unified Dressing - All five of the development team members should wear the customized T-Shirt with the CodeCraft logo.</li></ul>               |



- Remember to make eye contacts to audiences, especially the accessors.
- While one developer speaks, all the other developers should listen to him/her carefully.

## 🎨 PowerPoint Design

- Style: Elements of our product and logo should be reused in the PowerPoint, including puzzles and theme color (ie. Light Green).
- PowerPoint should not contain too much words; rather, it should have clear focuses on the summarized bullet points of each developer's script.

## Presentation Flow

i After 2 meetings' practice, we finally have decided the exact time length for each section to fulfill the 15 minutes' time limit.

| Content                                    | Presenter              | Duration                                |
|--------------------------------------------|------------------------|-----------------------------------------|
| Funny Introduction                         | Yifan Zhang & Yiru Liu | 30s                                     |
| Product Overview                           | Yiru                   | 45s                                     |
| Team Information                           | Yiru                   | 30s                                     |
| Requirements (Functional + Non-functional) | Jiayi Wang             | 1min                                    |
| UI Design                                  | Jiayi                  | 2min                                    |
| Live Demo: User Functions                  | Howard Li              | 3.5min                                  |
| Live Demo Admin Specific Functions         | Yifan                  | 1.5min                                  |
| AI Details                                 | Yan Gong               | 2min                                    |
| Technologies                               | Yan                    | 30s                                     |
| Collaborative tools                        | Yifan                  | 30s                                     |
| Key Challenges                             | Yifan                  | 1min                                    |
| Proud Moments                              | Jiayi                  | 30s                                     |
| Lessons Learned                            | Yiru                   | 30s                                     |
| Acknowledgement & Thank You                | Yiru                   | 10s                                     |
|                                            |                        | Total Estimated Duration:<br>14min55sec |

## Presentation & Product Feedback

Feeback from Rina:

- On presentation: An engaging presentation with adequate eye contacts and entertainment. Development teams show strong enthusiasm and efforts in developing the product.
- On product: The UI design is great. Moreover, the product has implemented all the functionalities as specified in the requirements.