

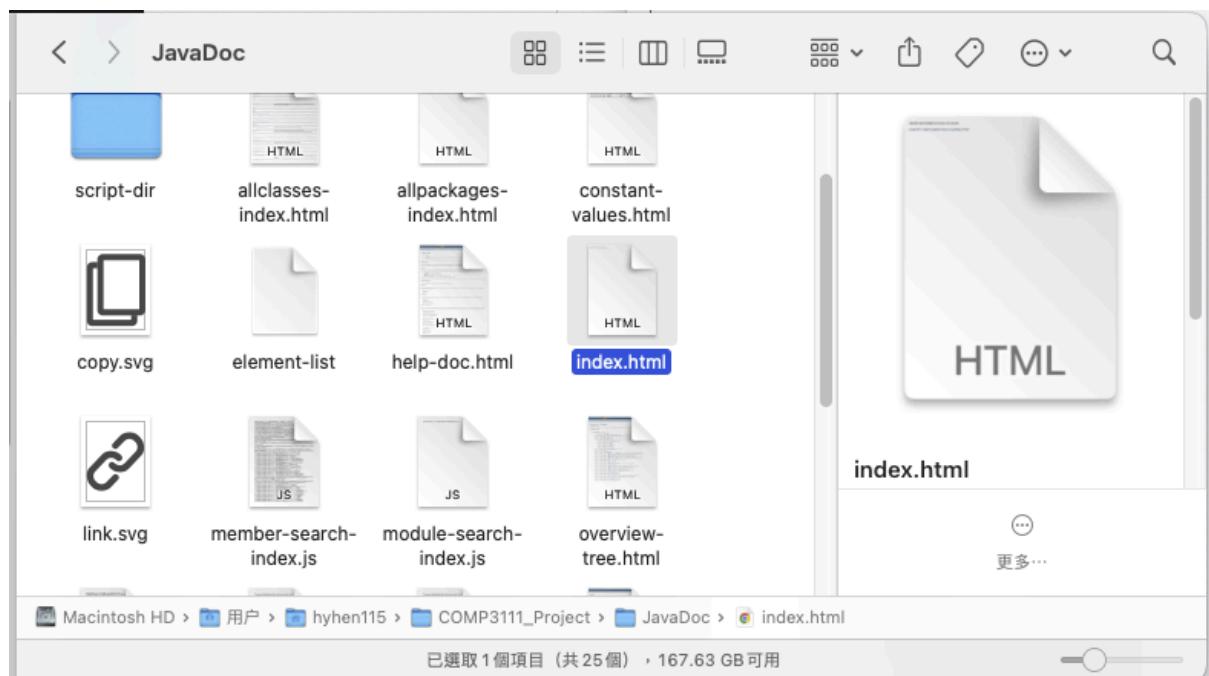
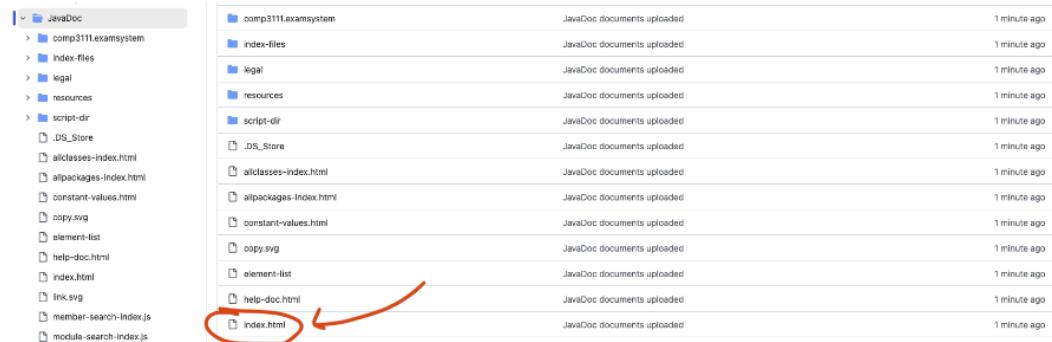
Supplementary Notes

All Sample inputs and outputs and User Menu of the application

JavaDocs How to Find

JavaDoc

After you clone the repo into your local machine find the file shown below and click the javadoc index.html file and it will show on website



Find the file and you will see the javadoc in the website

Sample datasets for all the entities are provided under the SampleData directory in Github.



Task 1: Lee Hyunjin

Files I implemented:

StudentLoginController.java
StudentRegisterController.java
StudentMainController.java
StudentExamController.java
StudentGradeStatisticsController.java

Limitations on Task 1:

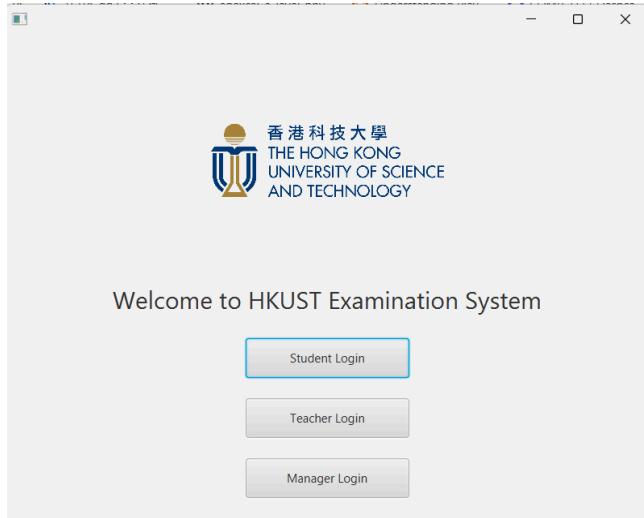
For the student registration, students are required to fill in their department. However, since there are too many departments in HKUST, we felt that it would not be a wise choice to make the user to select from a dropdown, hence we have implemented atextfield for the user to type into. However, we have not implemented a check for the department name, so there is a possibility the user types in words that are irrelevant to the department name. Although we do not feel this has a significant impact on the functionality of this program, we do feel that it could raise some issues later on in the future if someone wants to use the data from this program to filter students by their departments.

Assumptions on Task 1:

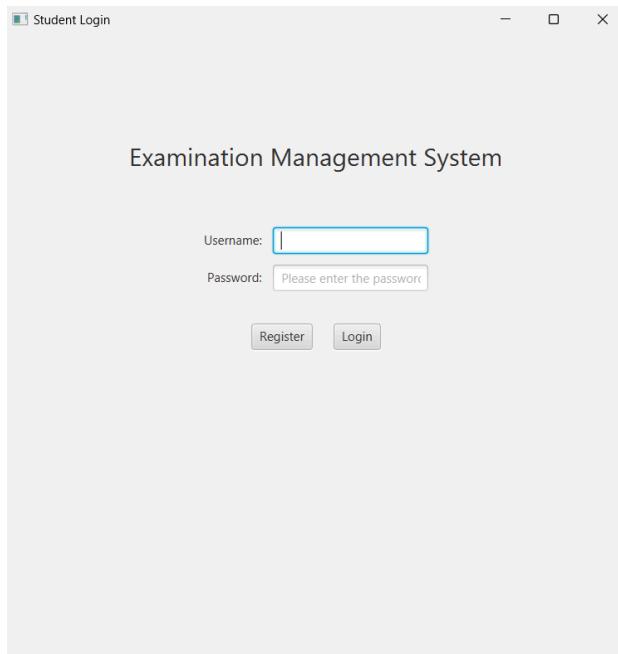
1. We have assumed that all of the exams (quizzes) in this system are multiple choice questions, as these questions can be marked and scored automatically by the system.
2. We have assumed that there is a separate program designated for handling student course registration. This is because according to the task descriptions, this program is not supposed to be responsible for that functionality, yet requires students' course registration information in order to handle certain implementations such as displaying exams specific to the student, etc (these will be explained later in this task supplementary notes). Hence, we have implemented a temporary student course registration functionality into Task 3, which will also be explained in further detail in Task 3 section of this supplementary notes.

Student Login System:

From the initial screen, the user selects “Student Login” to start the student login system.



Then, the user is presented with the student login screen.

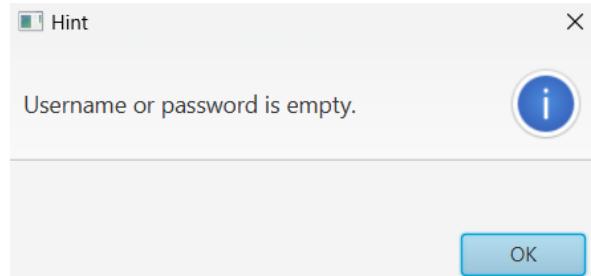


The login screen contains two text fields: Username and Password, and two buttons: Register and Login.

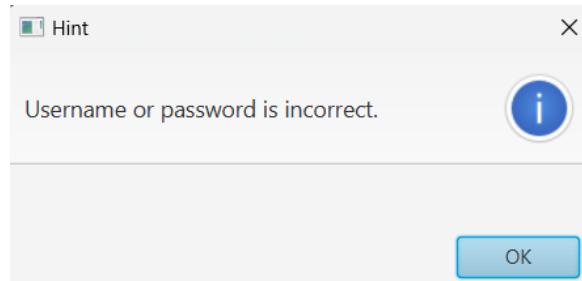
In order to login, the user types in their username and password and presses the login button. When the login button is pressed, the text in the username and password textfields are checked for two criteria:

- Is any of the textfields empty?

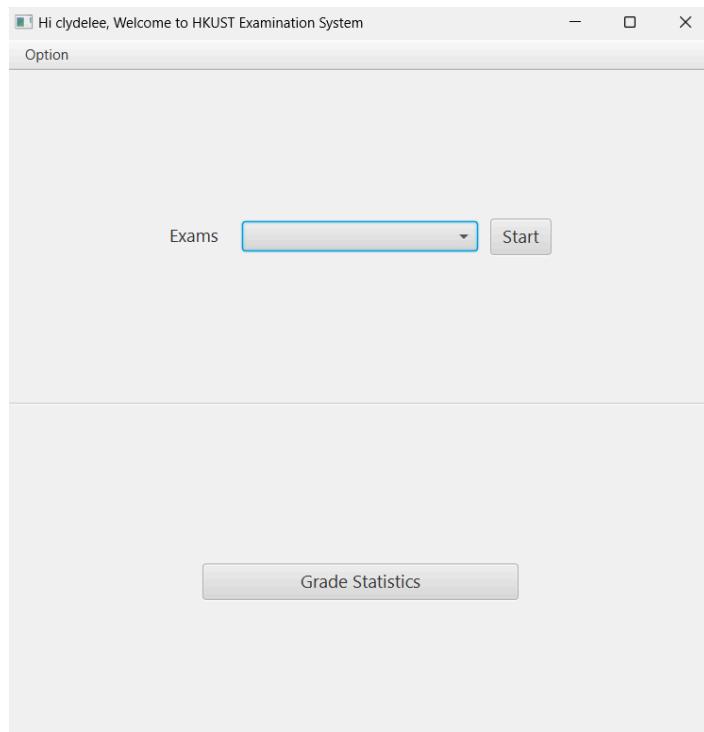
If any of them are empty, the user is shown a text alert to ask them to type in again.



- Does the login detail provided exist in the database?
 - If they do not exist, the user is shown a text alert to check their username and password details

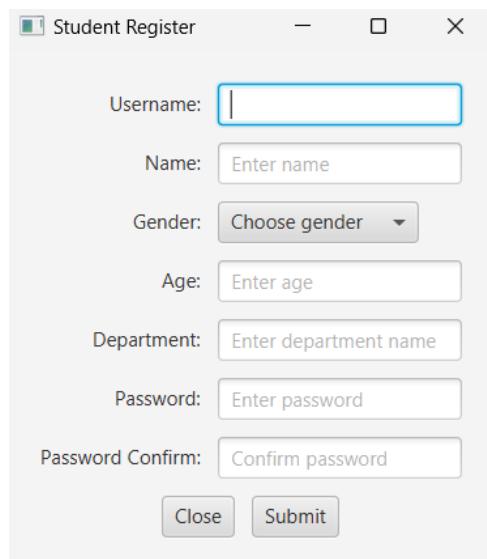


If the user passes the two checks, they are then sent to the main UI.



Student Register System

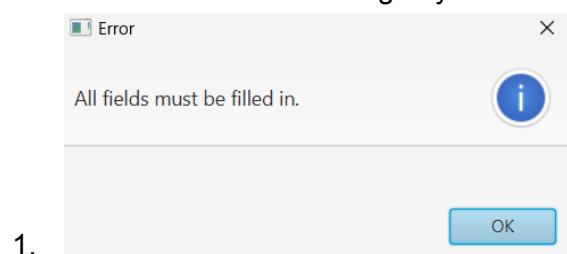
If the user selects the Register button instead, they will be sent to a register page.



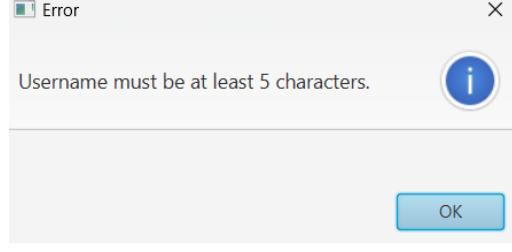
There are textfields and a dropdown box for the user to type in their respective details. Some items have specific checks. These are:

1. None of the fields should be empty
2. Username should be at least 5 characters long.
3. Age should be between 0 and 100.
4. Password should be at least 8 characters long.
5. Password and Password Confirm should be identical.
6. Username should not already exist in the database.

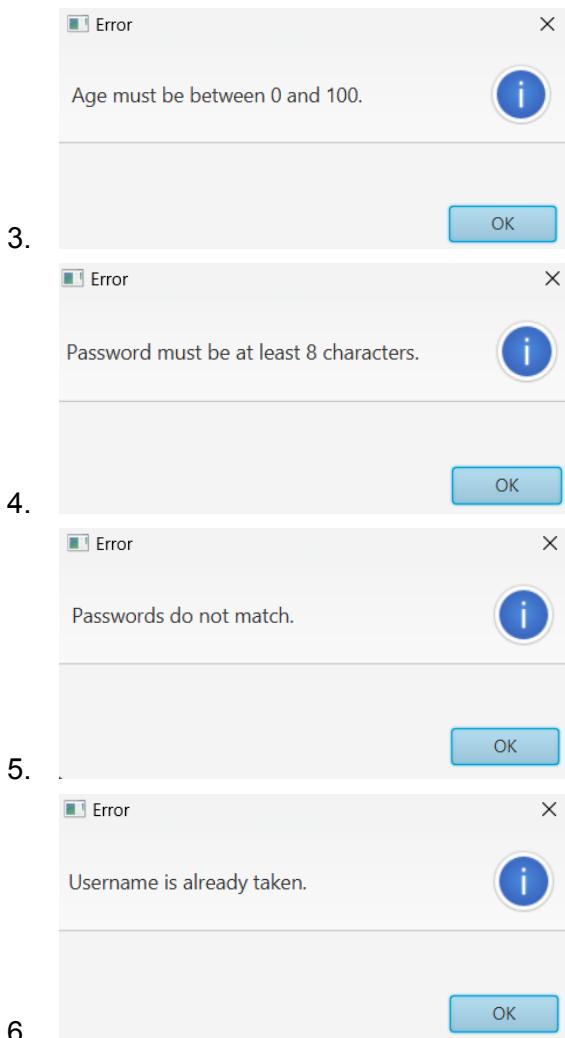
The user will be alerted for failing any of the checks, as shown as the images below.



1.



2.



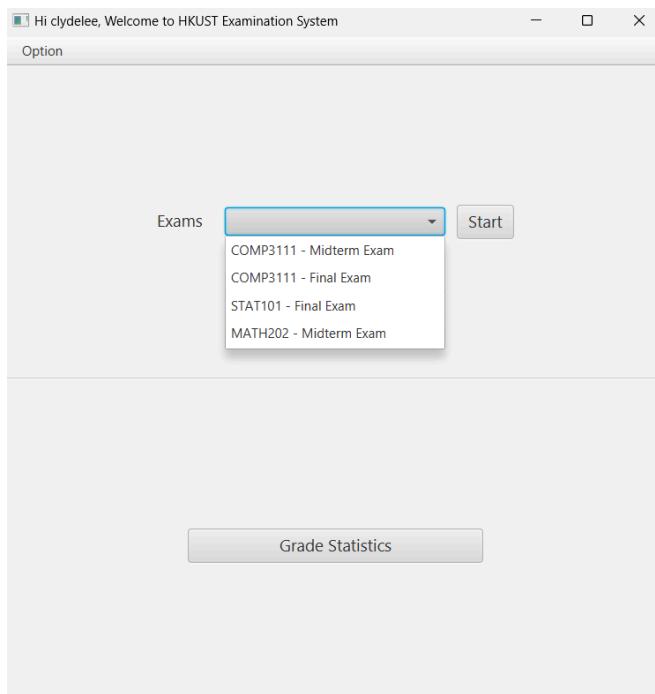
There are two buttons, Close and Register. When the user selects Close, the register window closes and the user can resume their login. If the user selects Register, the system will do the above checks on the data entered and will handle register accordingly.

Handling register is done by creating a new instance of Student entity and adding it into the Student database.

Student Exam System

As mentioned above, after successful login the user is sent to the main UI. This UI contains a dropdown box to select an exam to take, a Start button to start the exam and a Grade Statistics button to go to the grade statistics UI.

As soon as the user is sent to the main UI, the program searches the student's registered courses, then finds all the exams that are under that course, and displays it in the dropdown box.

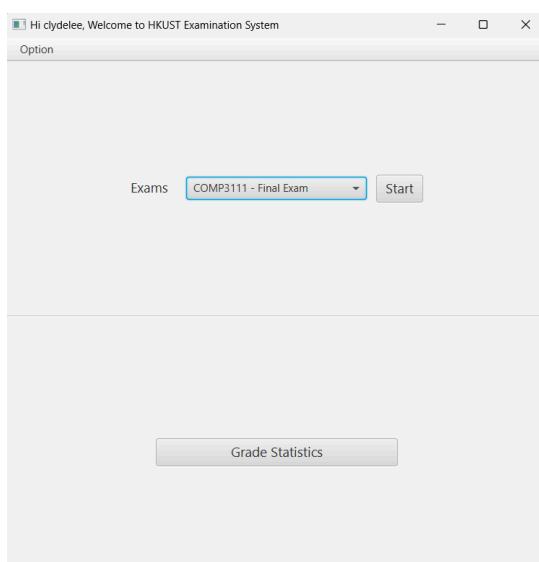


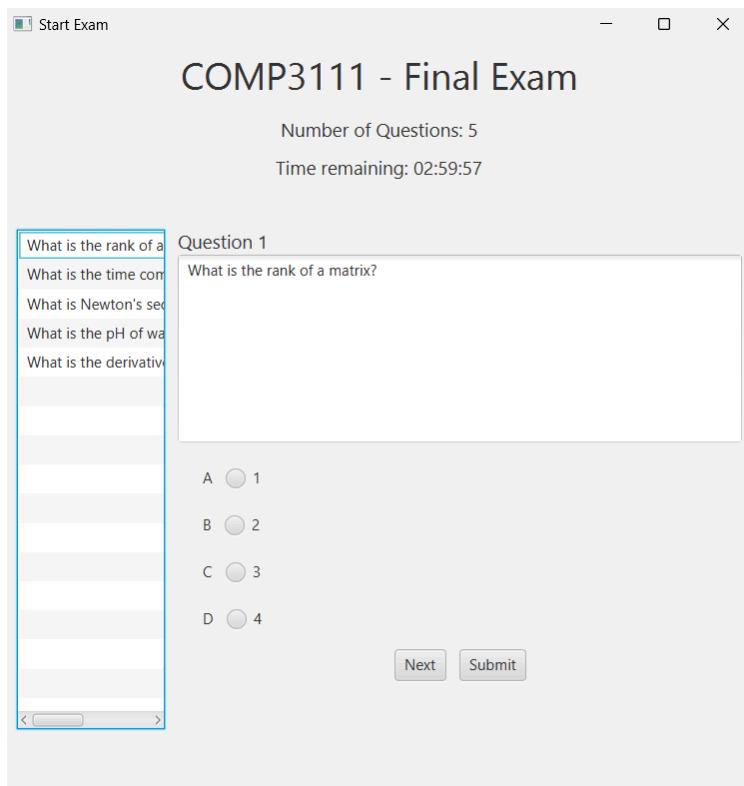
In this example, student “clydelee” is enrolled in COMP3111, STAT101 and MATH202, hence these are the exams that are available to be taken.

Note from our group

We understand that a course registration system was not a requirement for this project. However, we needed to display user-specific data, hence we implemented a temporary course registration system in the Manager section. If this program is to be used in reality, we assume that there will be a separate course registration software where this program can get the course registration database from, and the course registration section of Manager would not be necessary anymore.

Coming back to Task 1, the student can select one of the exams and press Start. Once they do, they will be sent to the exam UI.





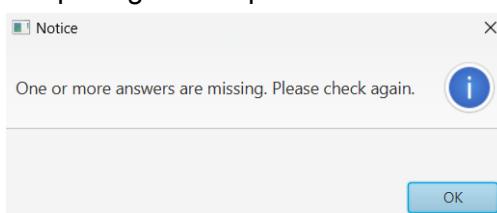
The Exam UI displays:

- The exam name
- Total number of questions to complete
- The time remaining for the exam
- A list on the left to make it easier for student to navigate between questions
- The question number and the question displayed on the right
- The answer choices displayed below the question
- Two buttons: Next and Submit

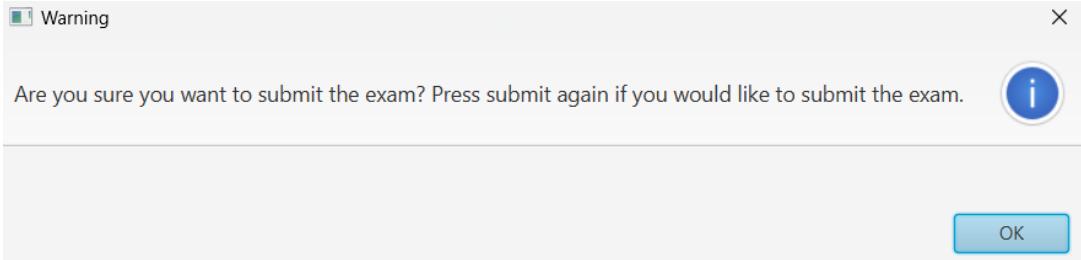
The functionality of this UI is very simple; the student selects the answers from the answer choices which they think is correct, then submit once they have completed.

Hence, this UI focuses on functionalities to help the student during the exam.

- The user can press the Next button to save their answer and also move on to the next question.
- The user can click on the question in the list to move to that question directly. However, navigating by clicking on list will not save the answer of the current question.
- The user is asked to check their answers again if they press submit without completing all the questions.



- After the user completes all their questions, in order to prevent accidental submission the system checks if this is their first time submitting with a full answer. If it is, then the student is shown an alert to check if they really want to submit. This is to prevent accidental submission and to give the student a final chance to check their answers.



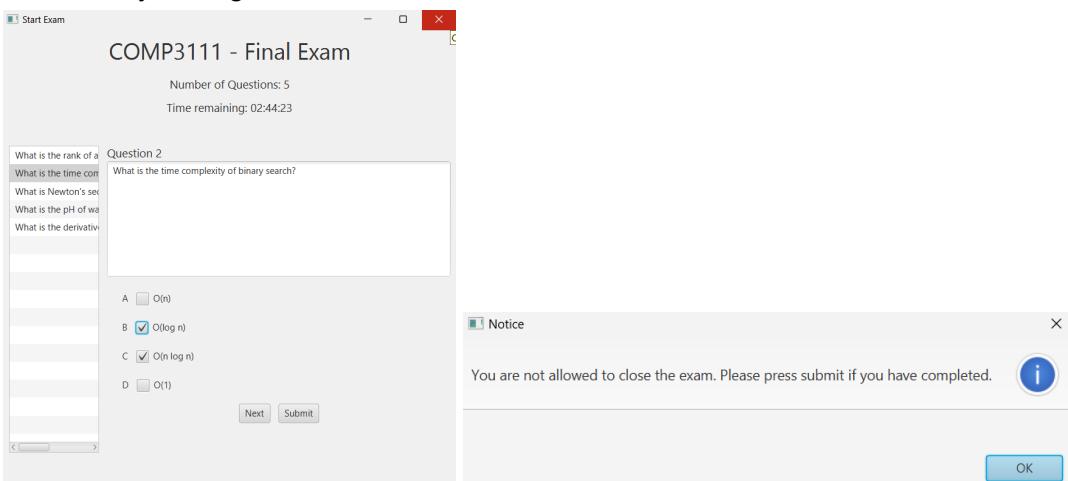
- The answer choices change depending on the type of question. If there is only one answer to the question, the answer choices are in radio buttons. If there are multiple possible answers, the answer choices are in checkboxes. This allows the student to know how many possible answers there are for the question.

Two screenshots of the COMP3111 - Final Exam software interface. Both screenshots show the same exam setup: Number of Questions: 5 and Time remaining: 02:46:49.

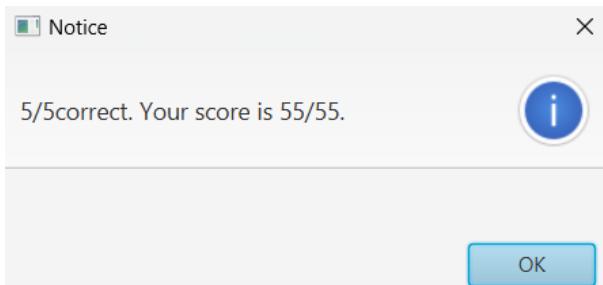
Screenshot 1 (Left): Shows Question 5. The question is "What is the derivative of x^2 ?". Below it are four answer options: A (radio button selected), B (radio button), C (radio button), and D (radio button). At the bottom are 'Next' and 'Submit' buttons.

Screenshot 2 (Right): Shows Question 2. The question is "What is the time complexity of binary search?". Below it are four answer options: A (checkbox), B (checkbox checked), C (checkbox checked), and D (checkbox). At the bottom are 'Next' and 'Submit' buttons.

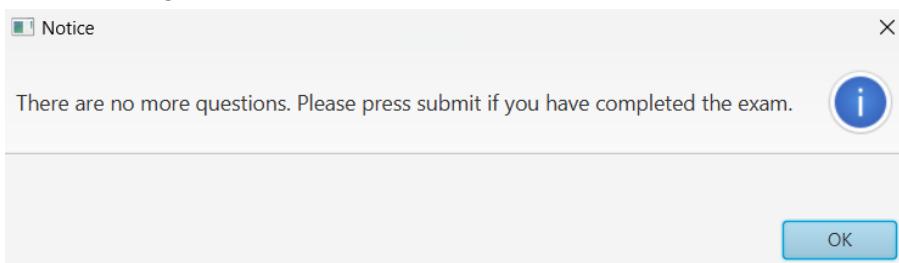
- The X button on the top right is disabled in order to prevent the student from accidentally exiting the exam.



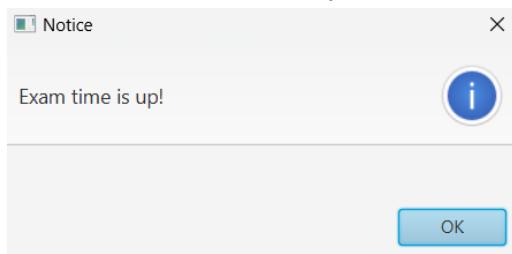
- Once the answers are submitted, the marks are automatically calculated and will display the results in an alert.



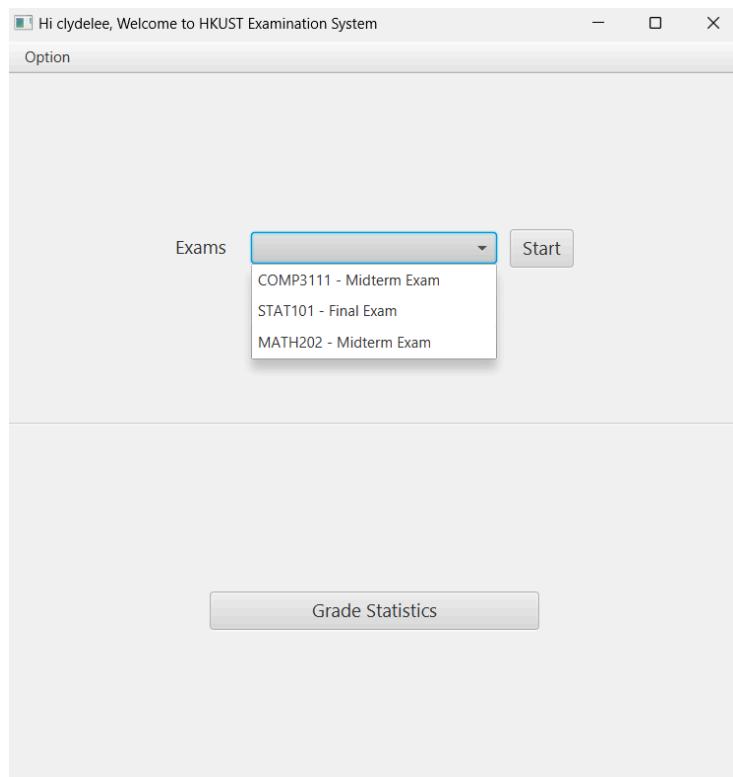
- If the student presses Next at the last question, they will be given an alert notifying them that it is the last question and that they should press Submit if they are done with the exam. The system will still save the answer for that question, so that the student can go back to previous questions via the listview to check their answers.



If the user runs out of time before the exam is submitted by the student, then the exam will be submitted immediately without checking if all the answers are completed. The exam UI will be closed immediately.

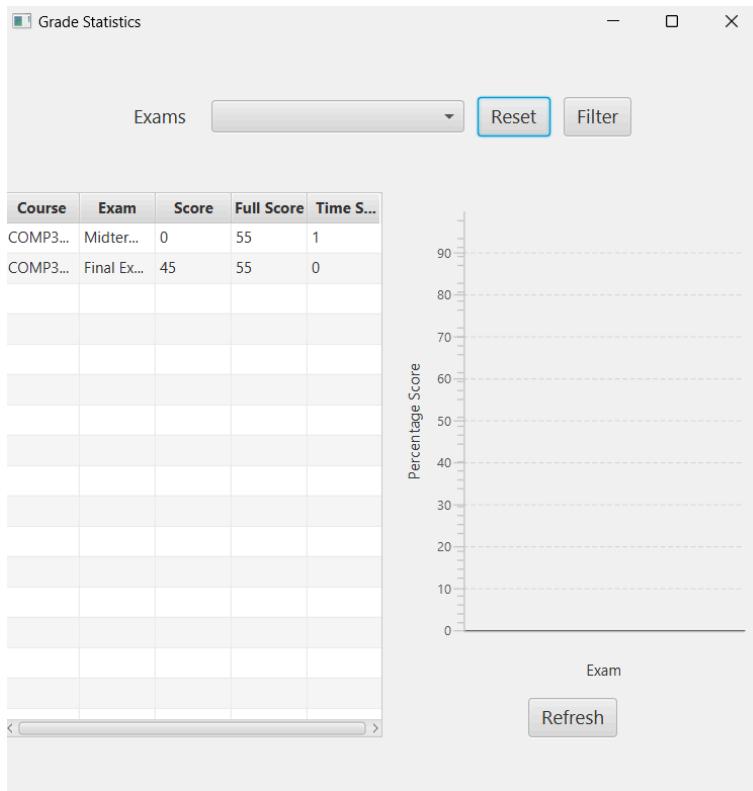


After exam is submitted, the student is no longer able to select that exam anymore.



The user can also press Grade Statistics to move to the grade statistics page.

Student Grade Statistics System



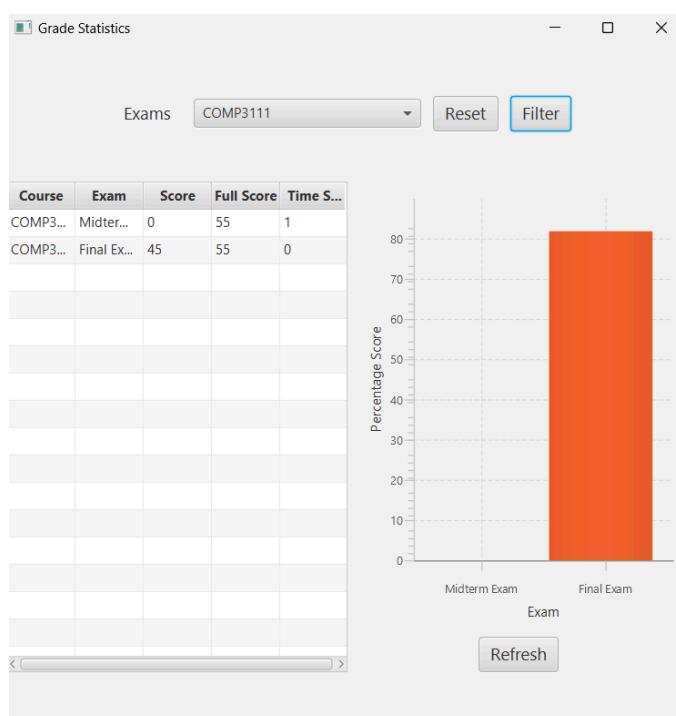
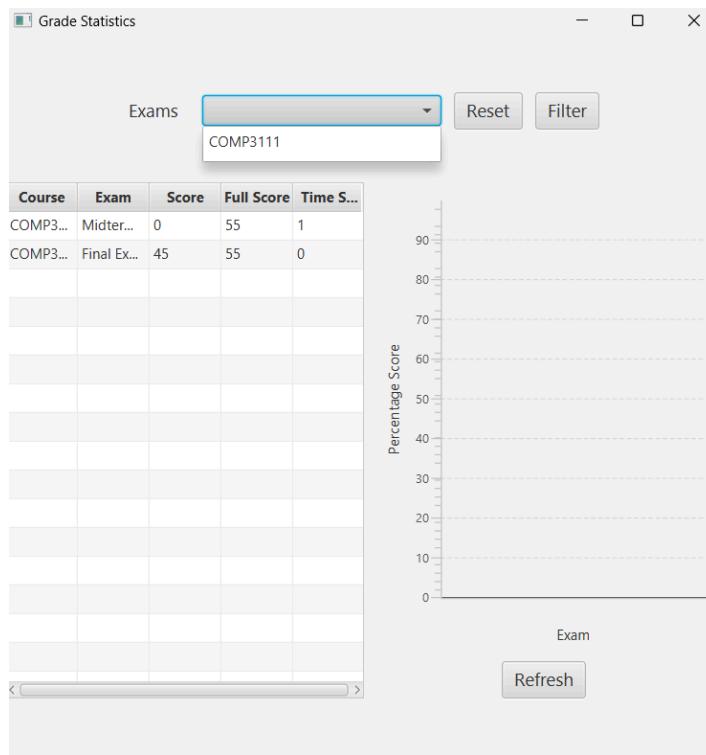
After completing an exam, the exam results will be saved onto the grade statistics page.

The grade statistics UI contains two large sections: a table consisting the exam information that includes course name, exam name, score, full score and time spent. Time spent is calculated in minutes rounded down.

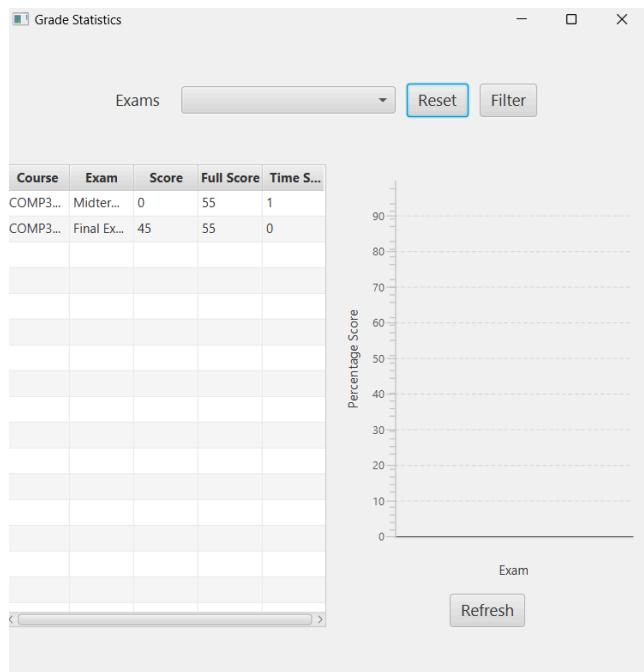
On the right, there is a bar chart that shows statistics for each exam. Initially, the bar chart is left empty.

At the top, there is a dropdown box. The dropdown box contains all the courses for which at least one exam has been taken. So for the case of the image above, since the only exam taken is COMP 3111 Final Exam, the dropdown box will only contain COMP 3111.

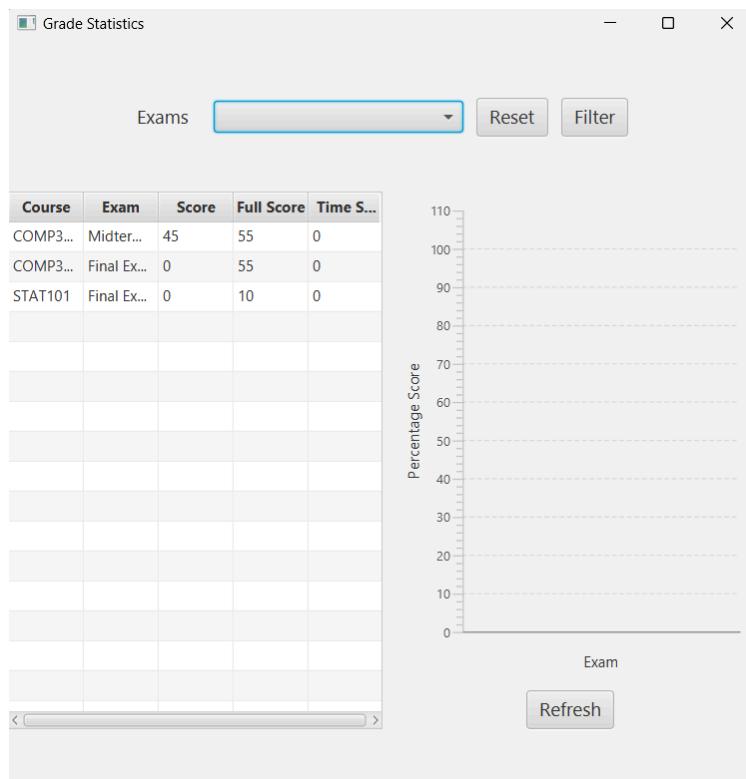
Choosing a course and pressing the Filter button allows the bar chart to show the statistics of all exams in that course.



Clicking the Reset button clears the dropdown box, which also clears the bar chart.



Clicking Refresh basically closes the current grade statistics UI and opens it again, getting new data from the database in the process. This means that if the student presses Refresh after taking another exam, the exam will be added into the table and the bar chart for that exam will also be available.



Task 2: Seokhyeon Hong

Files I implemented:

Controllers:

TeacherLoginController.java
TeacherMainController.java
TeacherRegisterController.java
ExamManagementController.java
QuestionBankManagementController.java

Entities:

Record.java
Question.java

Service:

ExamService.java
QuestionService.java
TeacherRegisterService.java

Database:

DatabaseService.java

Limitation for Task 2:

Our exam system only supports multiple choice questions to assure it's auto grading functionality, where subjectivity doesn't come into force. Also, before adding question to the exam, the user must create the exam first.

Assumption for Task 2:

Currently, all the questions done on our systems are multiple choice. This is to ensure that all the exams can be automatically graded,

Record Class:

Record class tracks which question is required for which exam. It contains exam id and question id, and it will allow the system to keep track of which question is included in which exam.

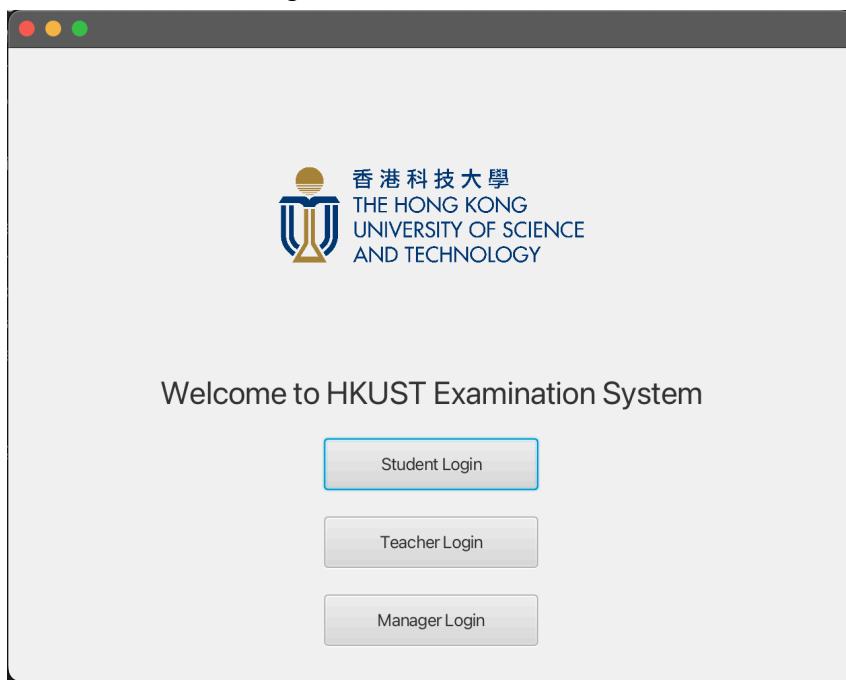
Question Class:

Question class tracks all the relevant information about the question. It will contain question, options for answer, and question type, question score, and answer.

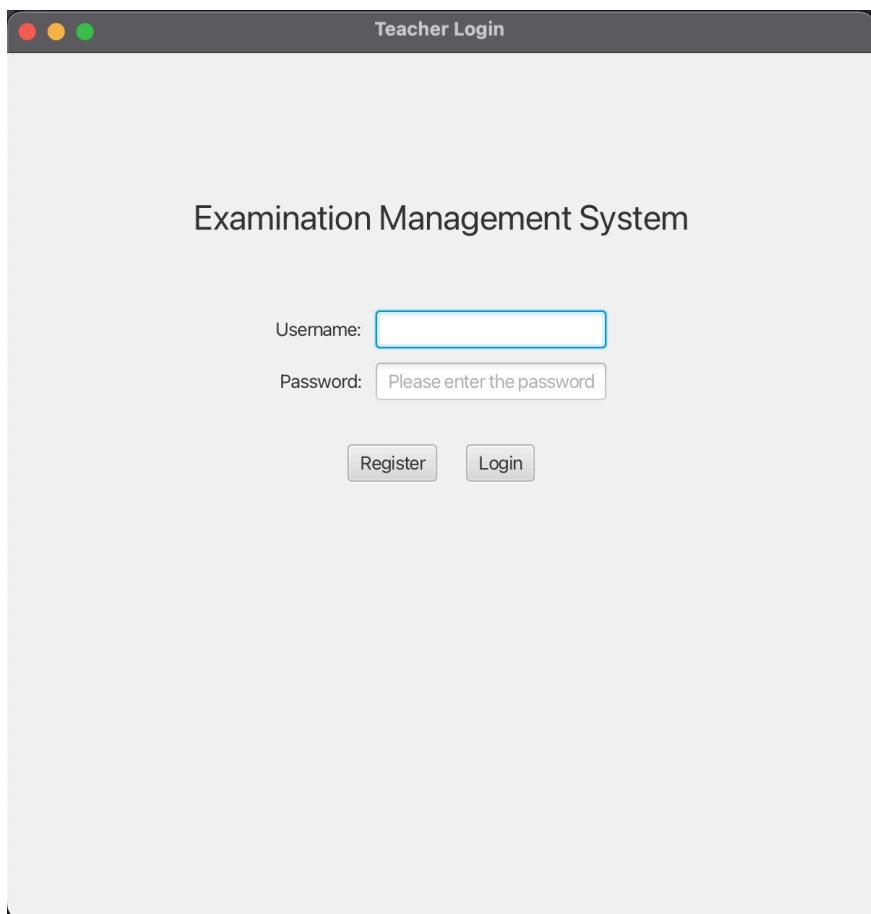
Teacher Registration System:

From the main screen:

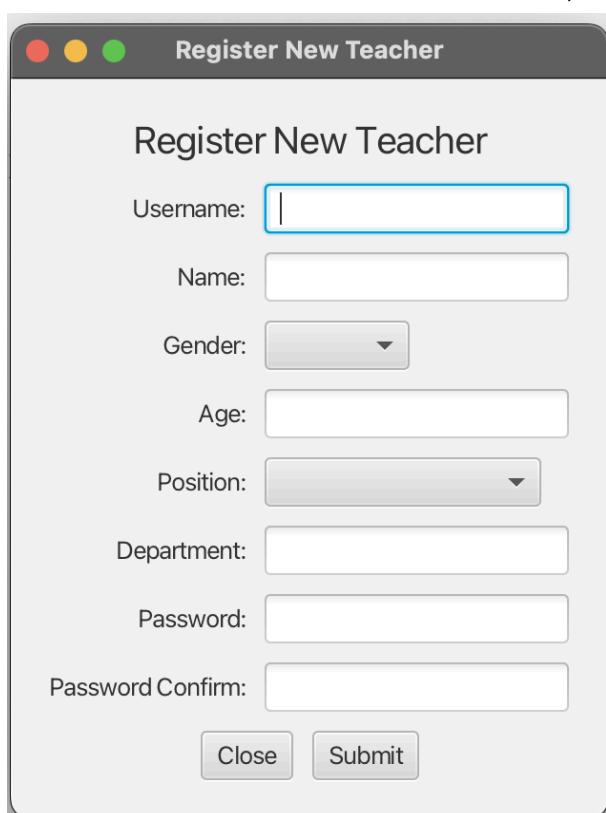
Click on Teacher Login Button



Click on Teacher Login to allow teacher to log on.



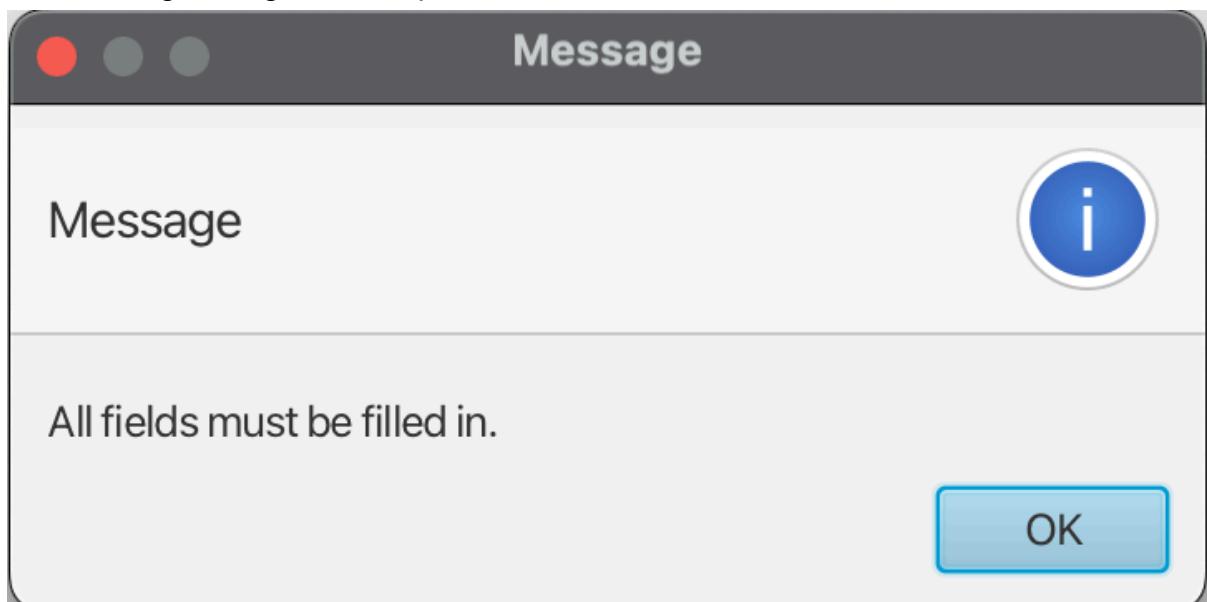
Teacher can simply input their username or password and click login.
If the teacher does not have an account, the one should click on the Register button.



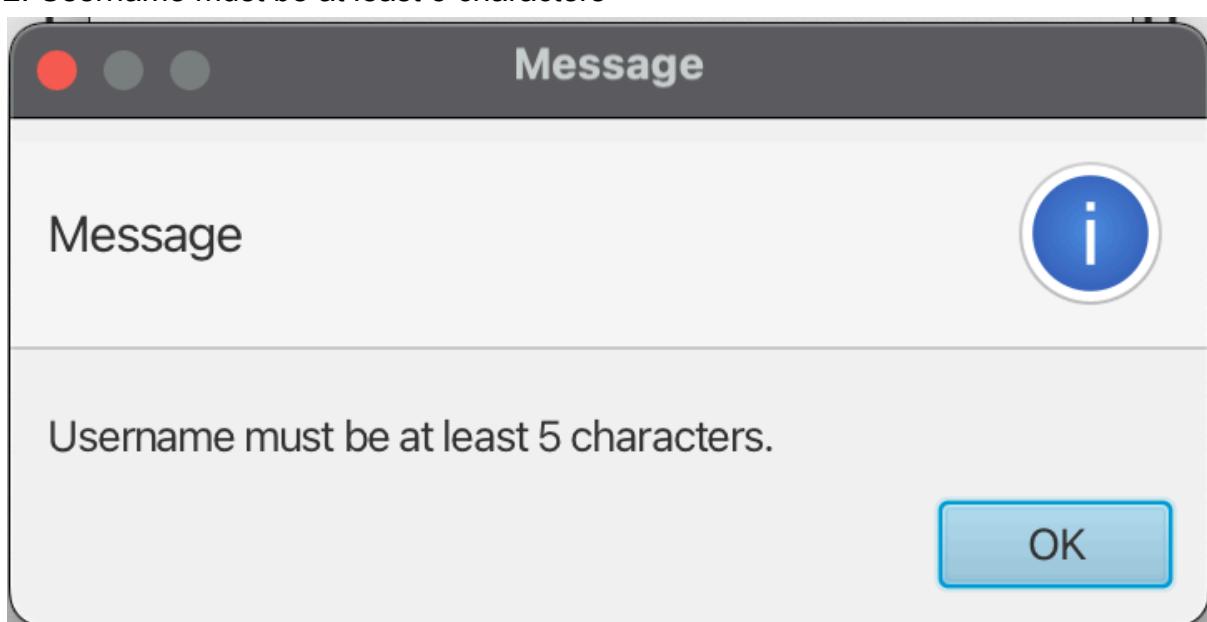
After clicking the register button, the user will see this popup. The user should input all the fields. And click submit to create the account. If any of the fields is missing or the password and password confirm is not matching, it will alert and the system will not go to create the account.

There are several criteria that the account should fulfill.

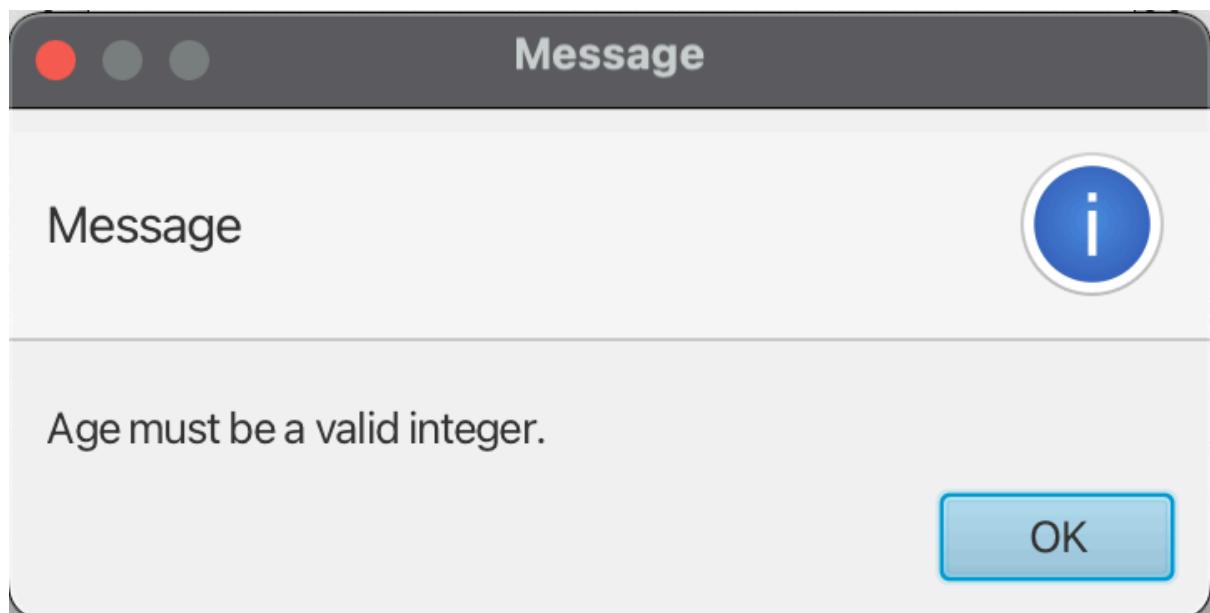
1. When registering, all the input fields must be filled.



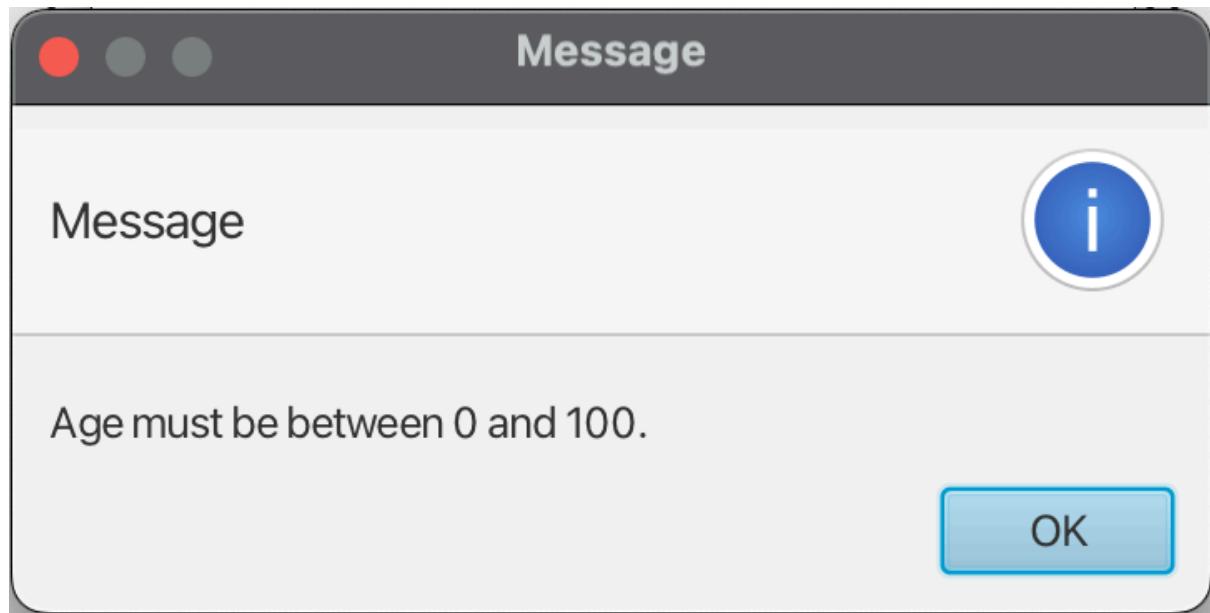
2. Username must be at least 5 characters



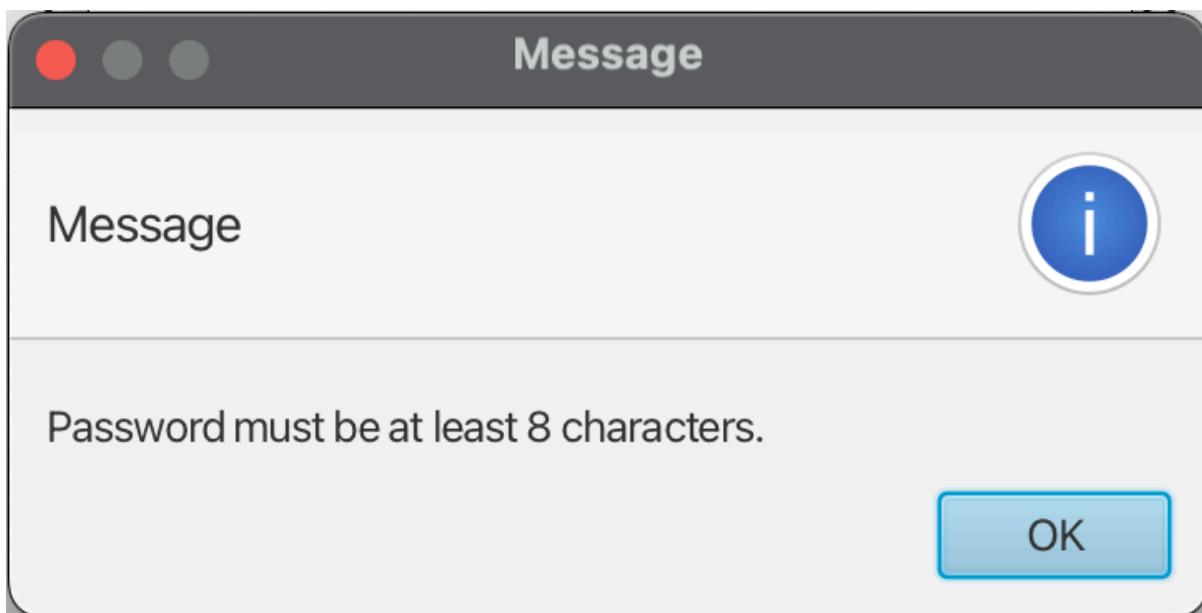
3. Age must be an integer



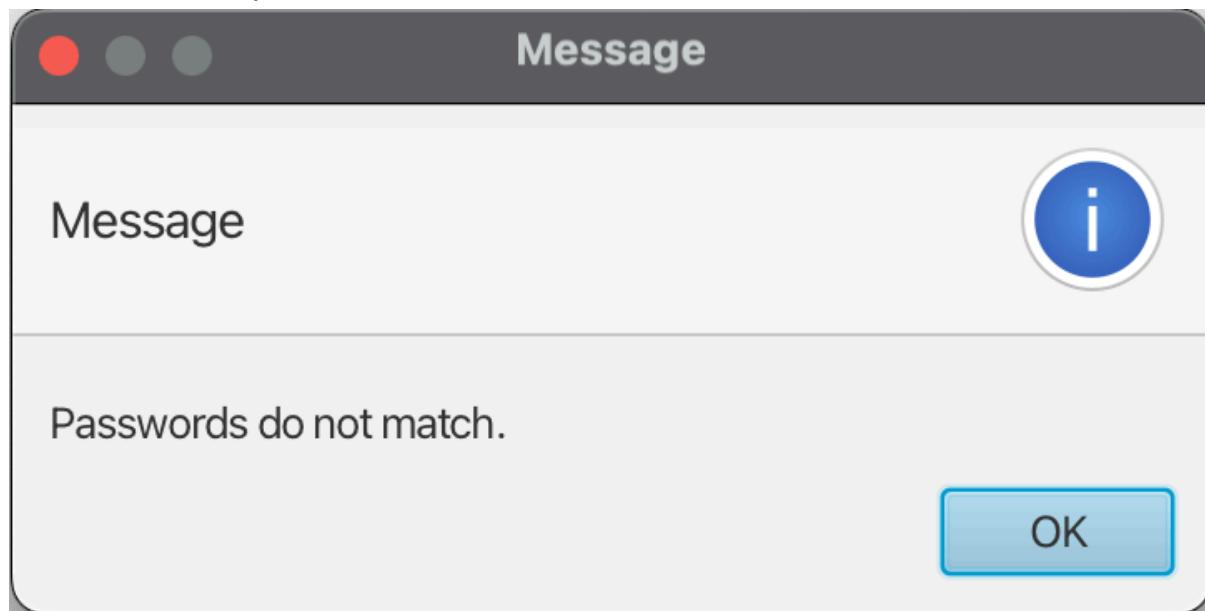
4. Age must be an integer between 0 and 100



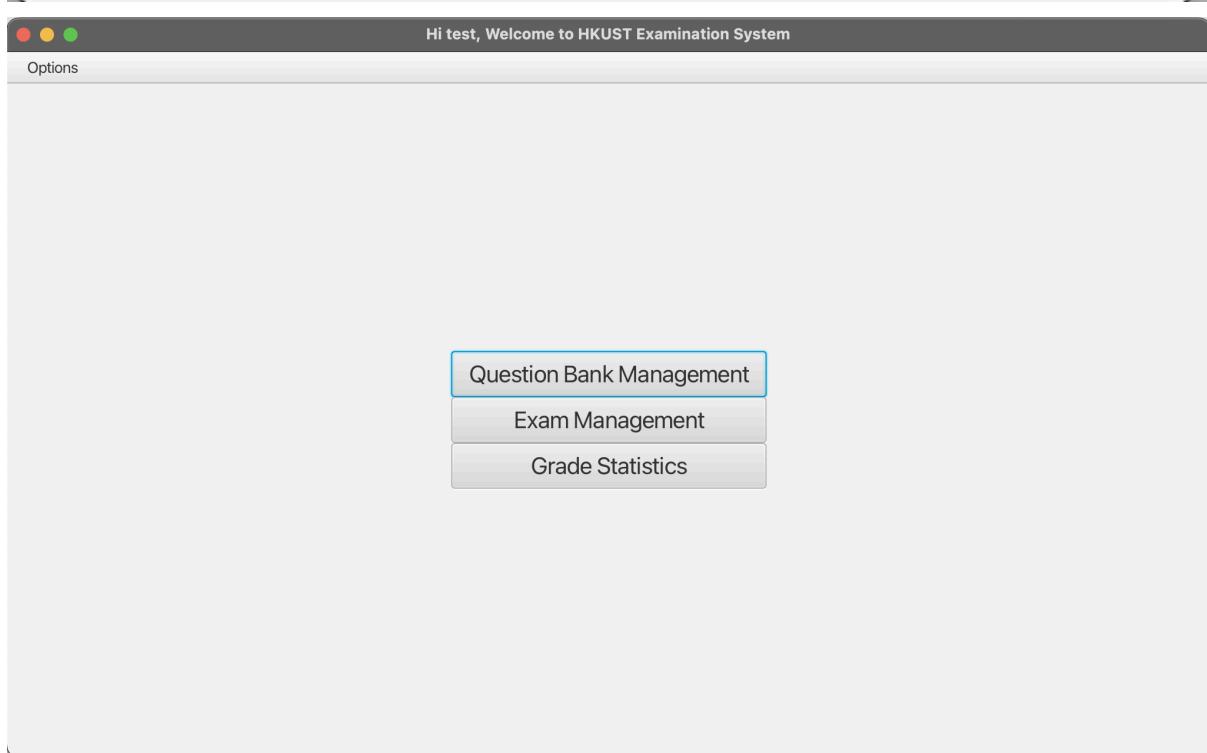
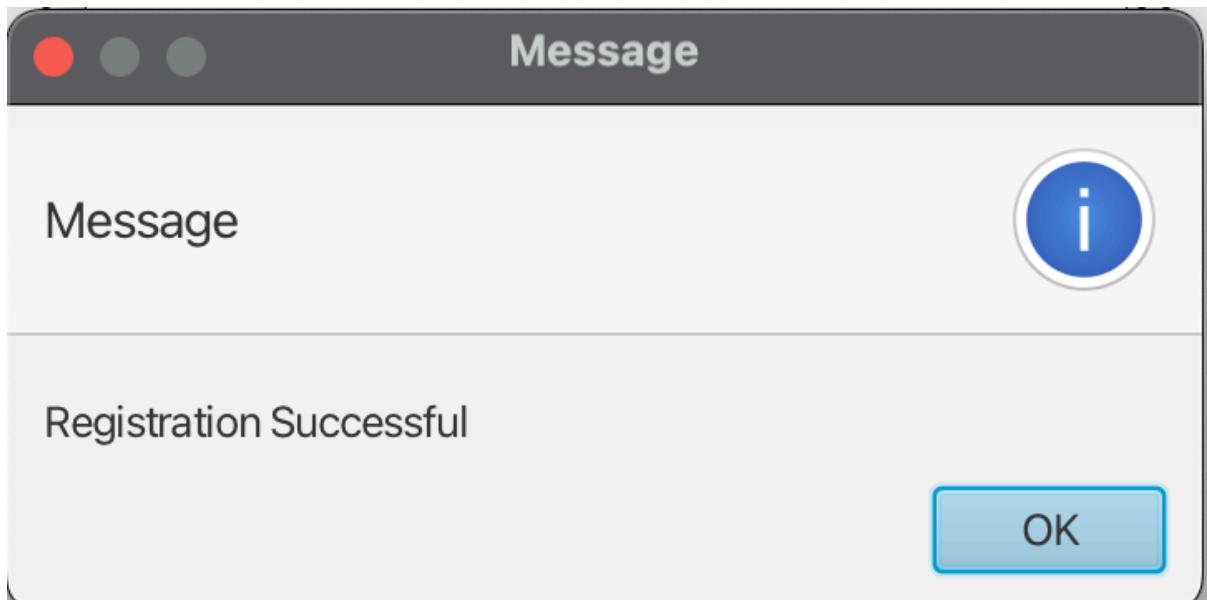
5. Password must be at least 8 characters



6. Password and passwordconfirm should match



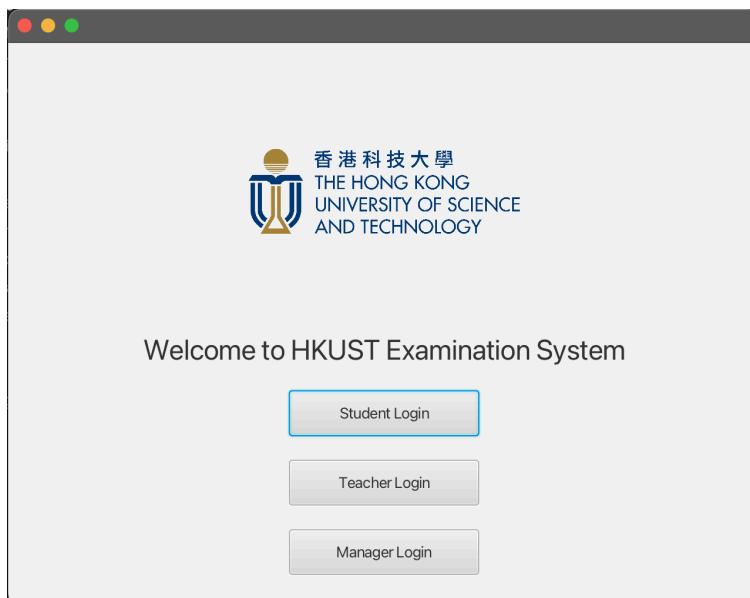
If all the criterias are matched, it will show this pop up



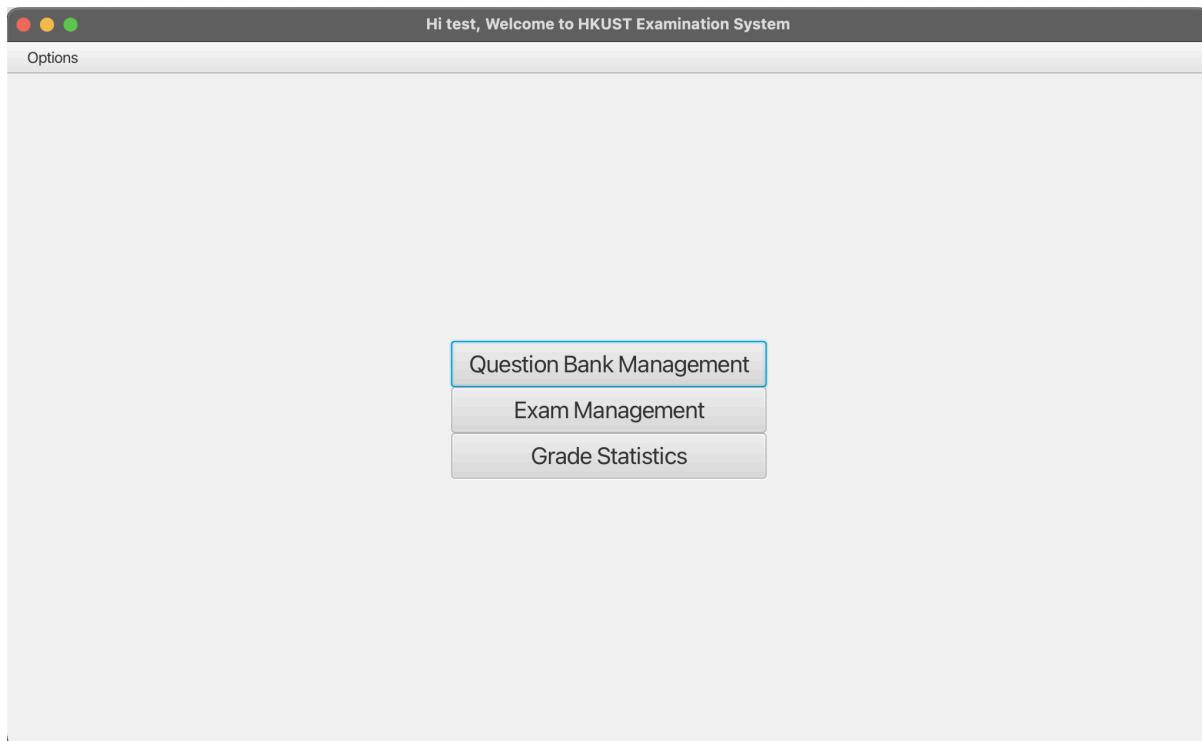
The user will see this screen after logging in.

Question Bank Management System:

For the teachers to create questions in the question bank, teachers could add questions to the question bank, which can be used in the exams.



After logging in using the Teacher Login system described above, the user will see this main system.



The teacher will click on the Question Bank Management Button. The teacher will see this screen after clicking on the button.

Question Bank Management

Question	Option A	Option B	Option C	Option D	Answer
What is the rank of a ma...	1	2	3	4	A
What is the time comple...	O(n)	O(log n)	O(n log n)	O(1)	B
What is Newton's secon...	F=ma	E=mc^2	V=IR	PV=nRT	A
What is the pH of water?	7	14	0	1	A
What is the capital of Fra...	Berlin	Madrid	Paris	Rome	C
What is the derivative of ...	2x	x^2	2	x	A
what's my name?	Sean	Shawn	Shaun	Shown	A
what's my name?	Sean	Shawn	Shaun	Shown	AB

Question: Type: Score: Reset

Question:
 Option A:
 Option B:
 Option C:
 Option D:
 Answer:
 Type:
 Score:

The screen will have three different functions.

On the top, it has filters based on Question, Type, and Score

On the left, it shows questions stored in the question database.

On the right, it shows input fields to add, delete, or update questions.

FILTER

To filter, input any part of the question, select type, or score. It can filter based on what's been entered. If name, is entered in Question, in this case, and press filter, it would only show these

Question Bank Management

Question	Option A	Option B	Option C	Option D	Answer
what's my name?	Sean	Shawn	Shaun	Shown	A
what's my name?	Sean	Shawn	Shaun	Shown	AB

Question: Type: Score: Reset

Question:
 Option A:
 Option B:
 Option C:
 Option D:
 Answer:
 Type:
 Score:

The user could put all the filters in, to filter it even more.

The screenshot shows the application window titled "Question Bank Management". On the left, there is a table with columns: Question, Option A, Option B, Option C, Option D, Answer, Type, and Score. One row is visible with the question "what's my name?", options Sean, Shawn, Shaun, Shown, AB, and Multiple. On the right, there are filter input fields: Question (what's my name?), Type (Multiple), and Score (20). Below these are buttons for Add, Update, Delete, and Refresh.

The user could put more filters in, the user would be able to filter it.

This screenshot is similar to the previous one but shows more filters applied. The filter inputs now include: Question (rank), Type (Multiple), and Score (10). The table on the left shows a single row with the question "what's my name?", options 1, 2, 3, 4, A, and Multiple, with a score of 10. The right side of the interface remains the same with the "Filter" button highlighted.

To reset, the user could press on Reset Button.

The screenshot shows the application after pressing the "Reset" button. The filter inputs are now empty: Question, Type, and Score. The table on the left contains several rows of questions and answers. The right side of the interface remains the same with the "Reset" button highlighted.

To reset the filter, the user could press on Reset Button. It would automatically refresh the question table. Along with a refreshing question adding a portion.

Adding Question

To add a question, the user must input all the data required by questions onto the right portion.

The screenshot shows the 'Question Bank Management' application window. On the left, there is a table with columns: Option A, Option B, Option C, Option D, Answer, Type, and Score. On the right, there is a detailed 'Add' dialog box with fields for Question, Option A, Option B, Option C, Option D, Answer, Type, and Score. The 'Type' dropdown in the dialog box is highlighted with a blue border.

	Option A	Option B	Option C	Option D	Answer	Type	Score
1	2	3	4	A	Multiple	10	
O(n)	O(log n)	O(n log n)	O(1)	B	Single	10	
F=ma	E=mc^2	V=IR	PV=nRT	A	Multiple	10	
7	14	0	1	A	Single	10	
Berlin	Madrid	Paris	Rome	C	Single	10	
2x	x^2	2	x	A	Multiple	10	
Sean	Shawn	Shaun	Shown	A	Single	10	
Sean	Shawn	Shaun	Shown	AB	Multiple	20	
1	2	3	4	A	Single	10	

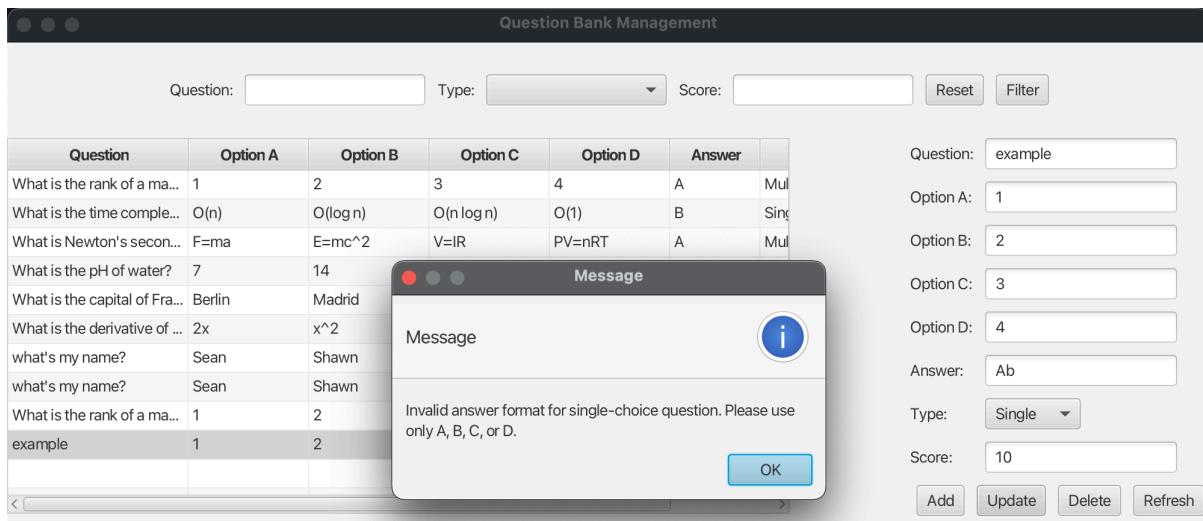
Input all the necessary informations on these fields or choice boxes.

The screenshot shows the 'Question Bank Management' application window. The 'Add' dialog box on the right now contains a successfully added question: 'example' with answer 'A' and score '10'. The 'Type' dropdown in the dialog box is still highlighted with a blue border.

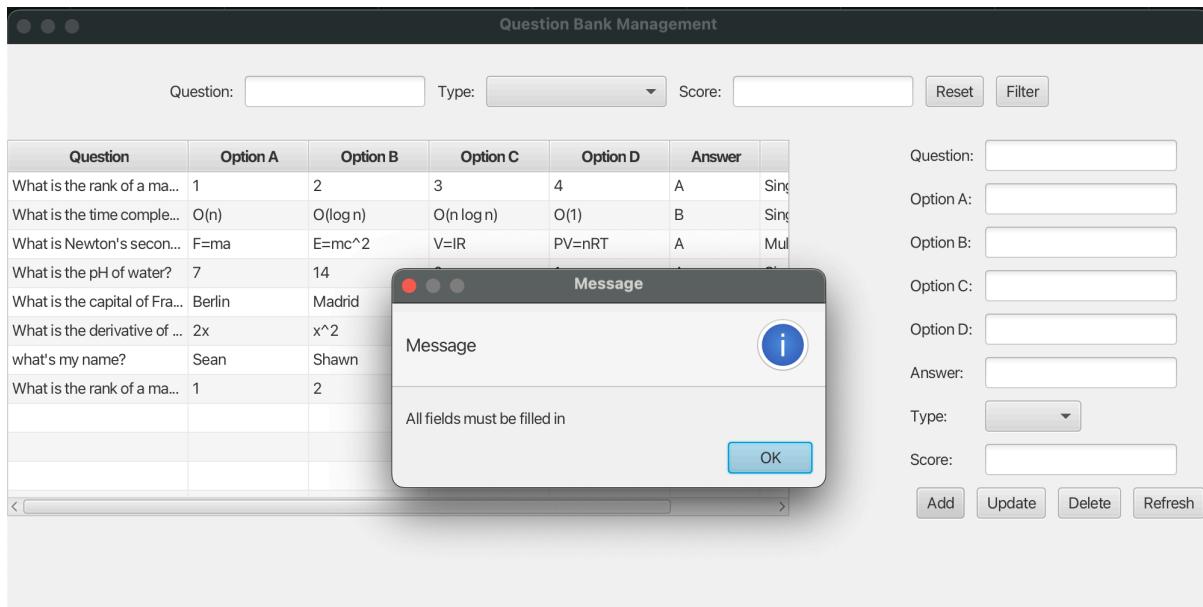
	Option A	Option B	Option C	Option D	Answer	Type	Score
1	2	3	4	A	Multiple	10	
O(n)	O(log n)	O(n log n)	O(1)	B	Single	10	
F=ma	E=mc^2	V=IR	PV=nRT	A	Multiple	10	
7	14	0	1	A	Single	10	
Berlin	Madrid	Paris	Rome	C	Single	10	
2x	x^2	2	x	A	Multiple	10	
Sean	Shawn	Shaun	Shown	A	Single	10	
Sean	Shawn	Shaun	Shown	AB	Multiple	20	
1	2	3	4	A	Single	10	

Then the user should press the Add button. The answer should be A/B/C/D for a single type of question, and a combination of A/B/C/D for multiple types of questions.

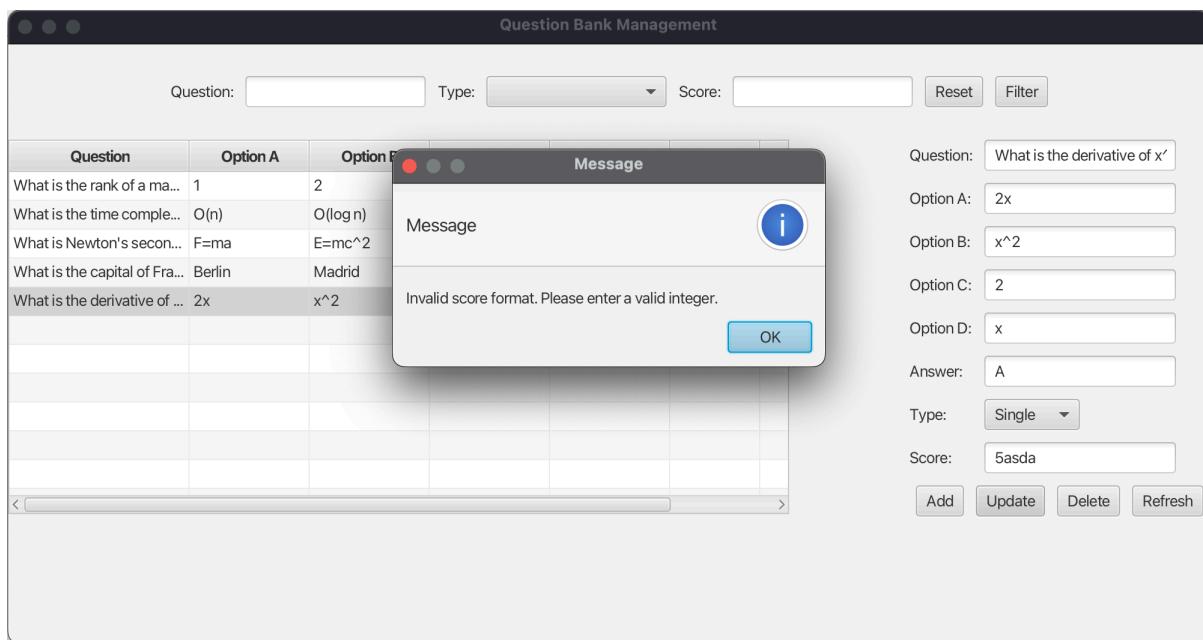
It will display a popup that says the question has been successfully added. It will add the question to the database, if it meets all the requirements. If requirements are not met, it will display another popup for requirements.



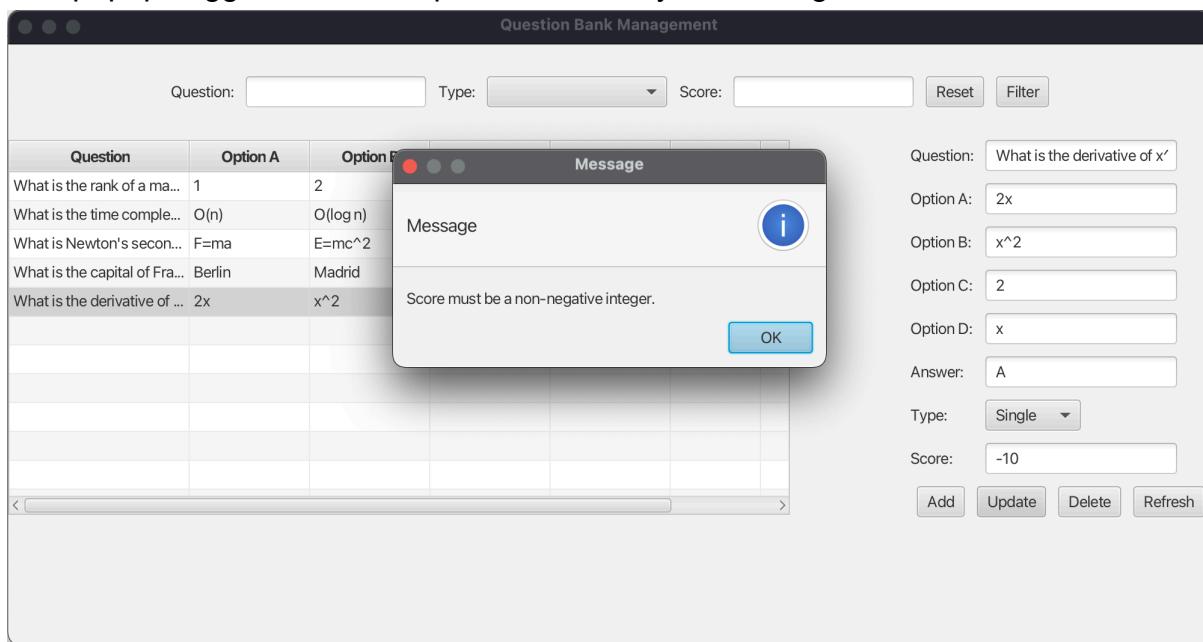
This pop up suggest that the answer format is invalid. It shows invalid if the single type of answer contains any other character than A/B/C/D, and for Multiple, anything other than Combination of A/B/C/D



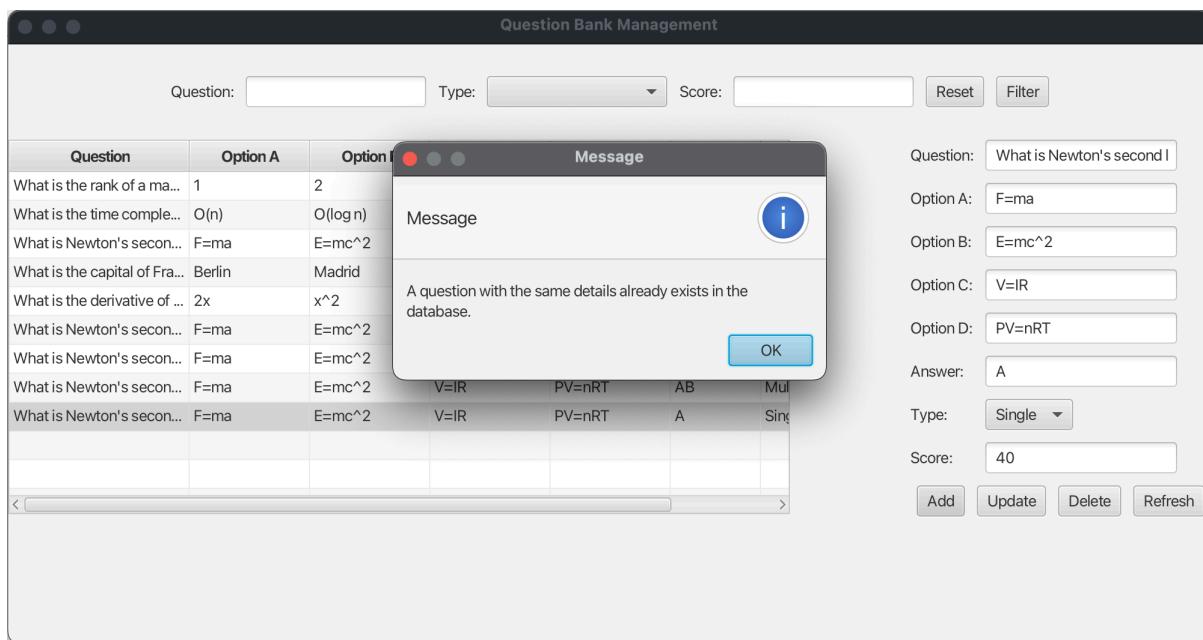
This pop up suggests that all fields must be filled in, and wouldn't let the question to be added



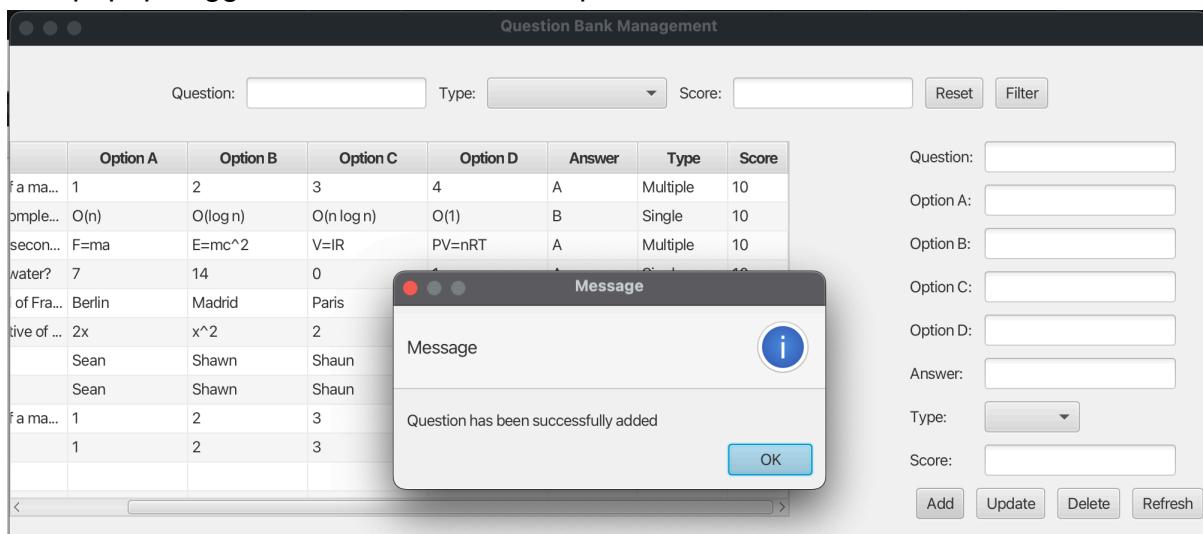
This popup suggests that the question can only have integer as its score.



This popup suggests that the question can only have positive integer as its score



This popup suggests that there exists a question that has same information



This popup suggests that the question has been successfully added to the database. After this has been added, the user will be able to see it on the table.

Update question

To update the question or to modify any part of the question, the user can select the question to modify on the table by clicking on the question on the table.

Question Bank Management

Question: Type: Score: Reset Filter

Question	Option A	Option B	Option C	Option D	Answer
What is the rank of a ma... 1	2	3	4	A	Multi
What is the time comple... O(n)	O(log n)	O(n log n)	O(1)	B	Single
What is Newton's secon... F=ma	E=mc^2	V=IR	PV=nRT	A	Multi
What is the pH of water? 7	14	0	1	A	Single
What is the capital of Fra... Berlin	Madrid	Paris	Rome	C	Single
What is the derivative of ... 2x	x^2	2	x	A	Multi
what's my name? Sean	Shawn	Shaun	Shown	A	Single
what's my name? Sean	Shawn	Shaun	Shown	AB	Multi
What is the rank of a ma... 1	2	3	4	A	Single

Question: What is the rank of a matrix? Type: Multiple Score: 10

Add Update Delete Refresh

If it is clicked, the selected question will turn blue and have all the details on the right part.

As same as the add question part, the user can modify those fields as the user wants, and click on the Update Button.

Question Bank Management

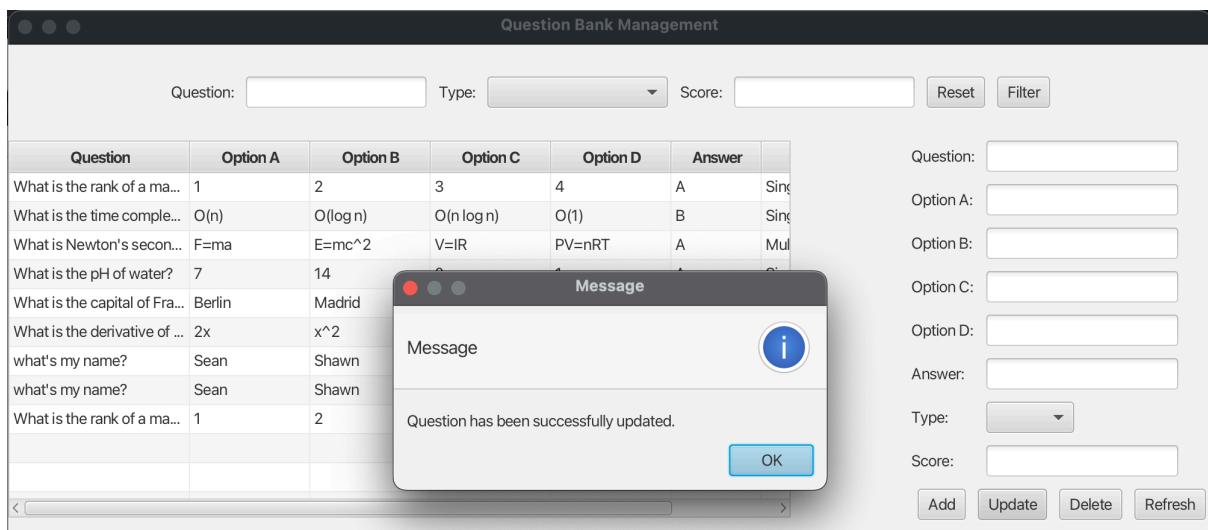
Question: Type: Score: Reset Filter

Question	Option A	Option B	Option C	Option D	Answer
What is the rank of a ma... 1	2	3	4	A	Single
What is the time comple... O(n)	O(log n)	O(n log n)	O(1)	B	Single
What is Newton's secon... F=ma	E=mc^2	V=IR	PV=nRT	A	Multi
What is the pH of water? 7	14	0	1	A	Single
What is the capital of Fra... Berlin	Madrid	Paris	Rome	C	Single
What is the derivative of ... 2x	x^2	2	x	A	Multi
what's my name? Sean	Shawn	Shaun	Shown	A	Single
what's my name? Sean	Shawn	Shaun	Shown	AB	Multi
What is the rank of a ma... 1	2	3	4	A	Single

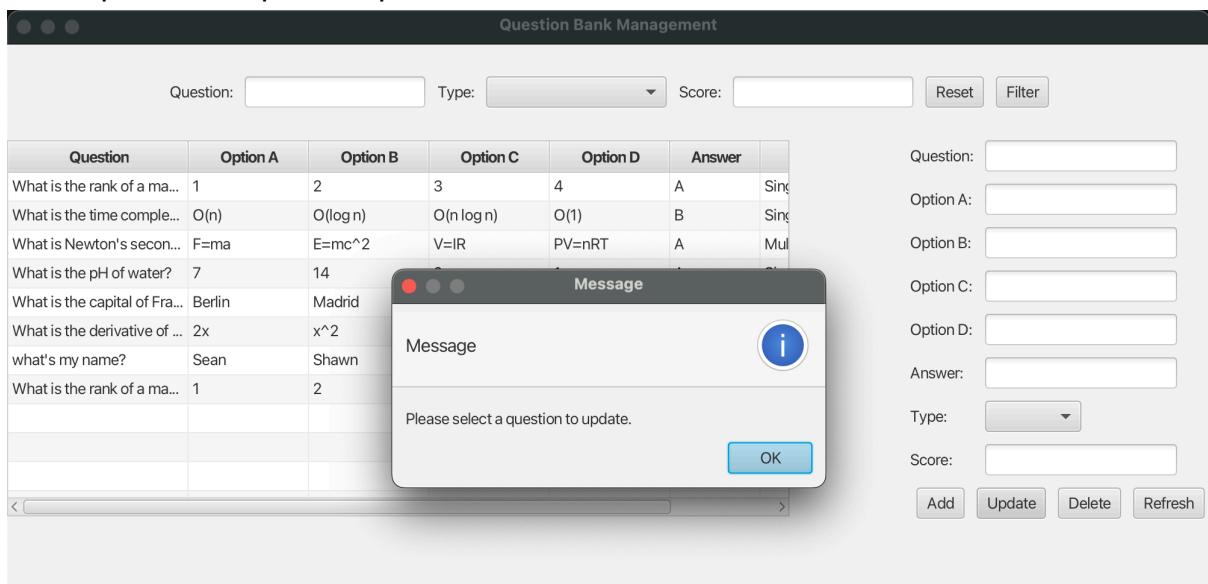
Question: What is the rank of a matrix? Type: Single Score: 10

Add Update Delete Refresh

After the update button is clicked, if it meets all the requirements, it will display a popup saying that the question has been successfully updated.



It will update the updated question to the database.



If the user didn't select the question, but pressed Update Button, the system will display a pop up saying "Please select a question to update"

Delete Question

To delete a question, the user will select the question to delete from the table by clicking on it.

The screenshot shows a window titled "Question Bank Management". At the top, there are search fields for "Question", "Type", and "Score", along with "Reset" and "Filter" buttons. Below is a table with columns: Question, Option A, Option B, Option C, Option D, and Answer. The row for "what's my name?" is highlighted in blue, indicating it is selected. To the right of the table, detailed information for this question is displayed: Question ("what's my name?"), Option A ("Sean"), Option B ("Shawn"), Option C ("Shaun"), Option D ("Shown"), Answer ("AB"), Type ("Multiple"), and Score ("20"). Buttons for "Add", "Update", "Delete", and "Refresh" are at the bottom right.

Question	Option A	Option B	Option C	Option D	Answer
What is the rank of a ma...	1	2	3	4	A
What is the time comple...	O(n)	O(log n)	O(n log n)	O(1)	B
What is Newton's secon...	F=ma	E=mc^2	V=IR	PV=nRT	A
What is the pH of water?	7	14	0	1	A
What is the capital of Fra...	Berlin	Madrid	París	Rome	C
What is the derivative of ...	2x	x^2	2	x	A
what's my name?	Sean	Shawn	Shaun	Shown	A
what's my name?	Sean	Shawn	Shaun	Shown	AB
What is the rank of a ma...	1	2	3	4	A

By having it clicked, the selected question will turn blue on the table, and it will display those informations on the right.

This screenshot is identical to the one above, showing the "Question Bank Management" application. The "what's my name?" question is still selected (blue row). The detailed information on the right and the bottom buttons are also the same. However, the "Delete" button at the bottom right is now highlighted with a blue border, indicating it is the active or next-clicked button.

The user can click on the Delete button.

The screenshot shows the Question Bank Management application interface. On the left, there is a table with columns: Question, Option A, Option B, Option C, Option D, and Answer. On the right, there are input fields for Question, Type, Score, and buttons for Reset, Filter, Add, Update, Delete, and Refresh. A modal dialog box titled "Message" with an information icon (i) is displayed in the center. The message inside the dialog says "Question has been successfully deleted." with an "OK" button at the bottom.

Question	Option A	Option B	Option C	Option D	Answer
What is the rank of a ma...	1	2	3	4	A
What is the time comple...	O(n)	O(log n)	O(n log n)	O(1)	B
What is Newton's secon...	F=ma	E=mc^2	V=IR	PV=nRT	A
What is the pH of water?	7	14	1	2	C
What is the capital of Fra...	Berlin	Madrid	Paris	London	D
What is the derivative of ...	2x	x^2	3x	4x	E
what's my name?	Sean	Shawn	Shaun	Shown	AB
what's my name?	Sean	Shawn	Shaun	Shown	AB
What is the rank of a ma...	1	2	3	4	A

After clicking, it would display a pop up that says Question has been successfully deleted. This would delete all the related information from the database.

If there is no question selected, it will display a popup saying “Please select a question to delete”. It will return to the

The screenshot shows the Question Bank Management application interface. On the left, there is a table with columns: Question, Option A, Option B, Option C, Option D, and Answer. On the right, there are input fields for Question, Type, Score, and buttons for Reset, Filter, Add, Update, Delete, and Refresh. A modal dialog box titled "Message" with an information icon (i) is displayed in the center. The message inside the dialog says "Please select a question to delete." with an "OK" button at the bottom.

Question	Option A	Option B	Option C	Option D	Answer
What is the rank of a ma...	1	2	3	4	A
What is the time comple...	O(n)	O(log n)	O(n log n)	O(1)	B
What is Newton's secon...	F=ma	E=mc^2	V=IR	PV=nRT	A
What is the pH of water?	7	14	1	2	C
What is the capital of Fra...	Berlin	Madrid	Paris	London	D
What is the derivative of ...	2x	x^2	3x	4x	E
what's my name?	Sean	Shawn	Shaun	Shown	AB
what's my name?	Sean	Shawn	Shaun	Shown	AB
What is the rank of a ma...	1	2	3	4	A

Refresh

Question Bank Management

Question	Option A	Option B	Option C	Option D	Answer
What is the rank of a ma...	1	2	3	4	A
What is the time comple...	O(n)	O(log n)	O(n log n)	O(1)	B
What is Newton's secon...	F=ma	E=mc^2	V=IR	PV=nRT	A
What is the pH of water?	7	14	0	1	A
What is the capital of Fra...	Berlin	Madrid	Paris	Rome	C
What is the derivative of ...	2x	x^2	2	x	A
what's my name?	Sean	Shawn	Shaun	Shown	A
What is the rank of a ma...	1	2	3	4	A

Question: Type: Score: Reset

Question:
 Option A:
 Option B:
 Option C:
 Option D:
 Answer:
 Type:
 Score:

Refresh button refreshes the table by fetching the data from the database.
It will clear all the fields in the question, but not the fields for filter.

Question Bank Management

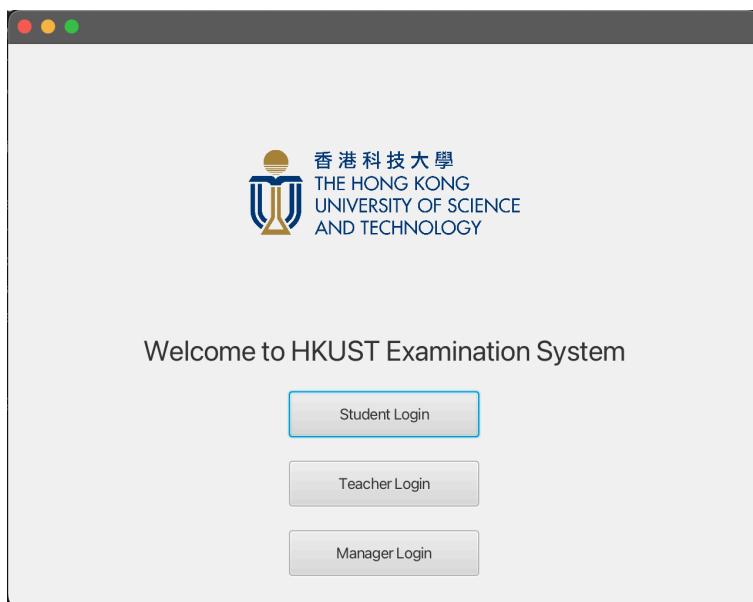
Question	Option A	Option B	Option C	Option D	Answer
What is the rank of a ma...	1	2	3	4	A
What is the time comple...	O(n)	O(log n)	O(n log n)	O(1)	B
What is Newton's secon...	F=ma	E=mc^2	V=IR	PV=nRT	A
What is the pH of water?	7	14	0	1	A
What is the capital of Fra...	Berlin	Madrid	Paris	Rome	C
What is the derivative of ...	2x	x^2	2	x	A
what's my name?	Sean	Shawn	Shaun	Shown	A
What is the rank of a ma...	1	2	3	4	A

Question: Type: Score: Reset

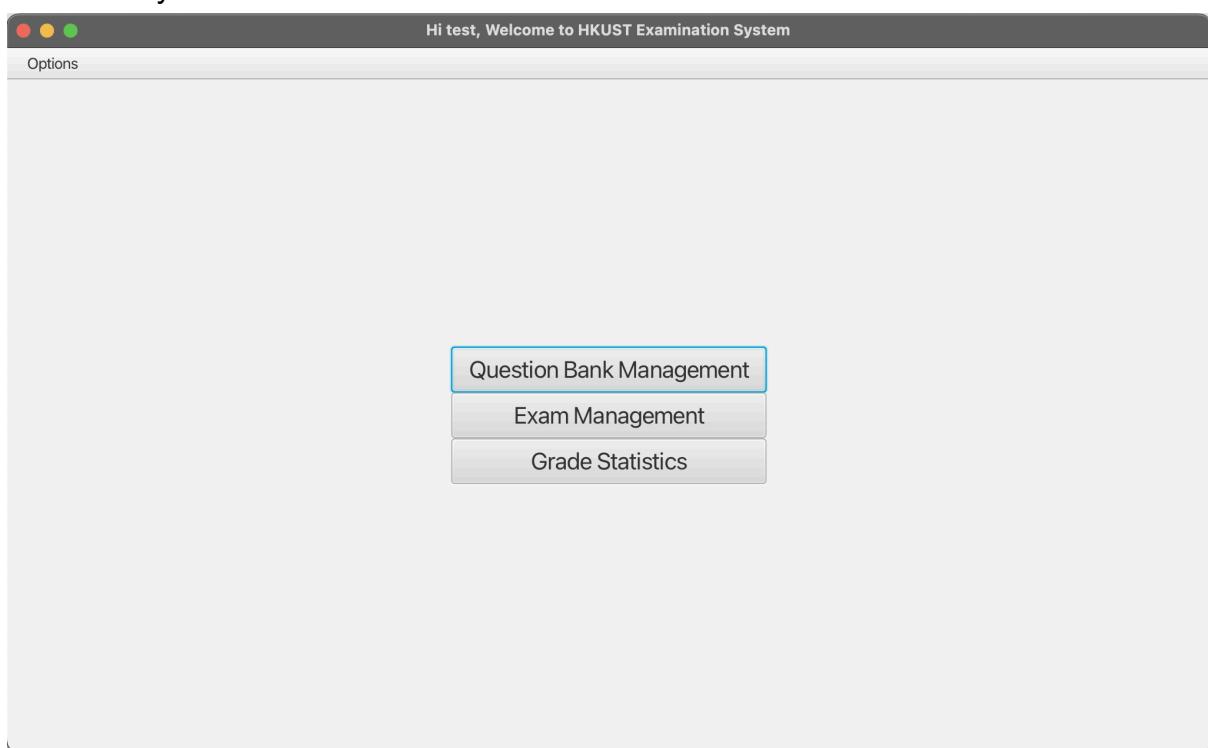
Question:
 Option A:
 Option B:
 Option C:
 Option D:
 Answer:
 Type:
 Score:

Exam Management System:

For the teachers to create exams in the examination system, teachers could add/remove questions to/from the exam, create exams, update information, and delete exams.



After logging in using the Teacher Login system described above, the user will see this main system.



The teacher will click on the Exam Management Button. The teacher will see this screen after clicking on the button.

The screenshot shows the Exam Management application window. At the top, there is a toolbar with buttons for 'Exam Name', 'Course ID', 'Publish', 'Reset', 'Filter', 'Question', 'Search', 'Type', 'Score', 'Score', 'Reset', and 'Filter'. Below the toolbar are three tables:

- Left Table (Exams):** Shows a list of exams with columns: Exam Name, Course ID, Exam Time, and Publish. Data includes: Midterm Exam (COMP3111, 120, yes), Final Exam (COMP3111, 180, yes), Midterm Exam (COMP202, 120, yes), Final Exam (COMP202, 180, yes), Midterm Exam (PHYS101, 120, yes), Final Exam (PHYS101, 180, yes), Midterm Exam (STAT101, 120, yes), Final Exam (STAT101, 180, yes), Midterm Exam (CHEM101, 120, yes), Final Exam (CHEM101, 180, yes), Midterm Exam (MATH202, 120, yes), and Final Exam (MATH202, 180, yes).
- Middle Table (Questions in Exam):** Shows a list of questions included in the exam with columns: Question in Exam, Type, and Score. It displays the message "No content in table".
- Right Table (All Questions):** Shows a list of all questions in the question database with columns: Question, Type, and Score. Data includes: What is the rank of a matrix? (Single, 10), What is the time complexity of bin... (Single, 10), What is Newton's second law? (Multiple, 10), What is the pH of water? (Single, 10), What is the capital of France? (Single, 10), What is the derivative of x^2 ? (Multiple, 10), and what's my name? (Single, 10).

Below the tables are several input fields and buttons:

- Input fields: 'Exam Name' (text box), 'Exam Time' (text box), 'Course ID' (dropdown), 'Publish' (dropdown).
- Buttons: 'Delete from left', 'Add to left', 'Delete', 'Refresh', 'Add', 'Update'.

This system has 2 different filters, three tables, and interface to add/remove questions to/from the exam, and create,update,delete exam.

On the Top left, it has a filter function for exams.

On the Top right, it has filter function for questions

The left table shows lists of exams in the exam database

The middle table shows the lists of questions included in the exam

The right table shows the lists of all the questions in the question database

Two buttons saying “Delete from left” and “Add to left” provides functionality to add or remove questions to/from the exam

Two text fields and two choice box provides functionality to create or update exams

Four buttons at the bottom provide delete, refresh, add, update functionality.

Filter Exam

This screenshot shows the same Exam Management application interface as the previous one, but with the 'Filter Exam' section highlighted. The 'Filter' button in the top toolbar is now red, indicating it is active. The rest of the interface remains the same, including the three tables and control buttons.

The user does not have to input all the fields to use the filtering function. Input any parts of the exam name, or select CourseID, or select whether it's published or not and press the Filter button. The user could input all three of them but filter works if only one of the input is entered. After filter button is pressed, it will display the filtered exams on the exam table. i.e) input Mid in textfield next to Exam Name, and press Filter button, it will display all the exams that contain Mid in Exam name on the table.

The screenshot shows the 'Exam Management' application window. At the top, there are search and filter controls: 'Exam Name: Mid', 'Course ID: (dropdown)', 'Publish: (dropdown)', 'Reset', 'Filter' (highlighted in blue), 'Question: Search', 'Type: (dropdown)', 'Score: Score', 'Reset', and 'Filter'. Below these are two tables. The left table has columns 'Exam Name', 'Course ID', 'Exam Time', and 'Publish'. It contains rows for 'Midterm Exam' with various course IDs and publish status. The right table has columns 'Question in Exam', 'Type', and 'Score'. It displays a list of questions with their types and scores. A message 'No content in table' is visible in the center of the right table area. At the bottom, there are buttons for 'Delete from left', 'Add to left', and other general actions: 'Delete', 'Refresh', 'Add', and 'Update'.

Reset Exam Filter

This screenshot is identical to the previous one, showing the 'Exam Management' application window. The 'Filter' button is now highlighted in blue, indicating it has been clicked. The rest of the interface, including the search fields, tables, and bottom buttons, remains the same.

To reset all the filters applied to the exam list, the user could simply press the Reset button on the left.

The screenshot shows a software interface titled "Exam Management". On the left, there is a table listing various exams with columns for Exam Name, Course ID, Exam Time, and Publish status. In the center, there is a large text area containing the message "No content in table". To the right, there is another table showing questions with columns for Question, Type, and Score. At the bottom of the screen, there are several buttons: "Delete from left", "Add to left", "Delete", "Refresh", "Add", and "Update".

Exam Name	Course ID	Exam Time	Publish
Midterm Exam	COMP3111	120	yes
Final Exam	COMP3111	180	yes
Midterm Exam	COMP202	120	yes
Final Exam	COMP202	180	yes
Midterm Exam	PHYS101	120	yes
Final Exam	PHYS101	180	yes
Midterm Exam	STAT101	120	yes
Final Exam	STAT101	180	yes
Midterm Exam	CHEM101	120	yes
Final Exam	CHEM101	180	yes
Midterm Exam	MATH202	120	yes
Final Exam	MATH202	180	yes

Question in Exam	Type	Score
No content in table		
What is the rank of a matrix?	Single	10
What is the time complexity of bin...	Single	10
What is Newton's second law?	Multiple	10
What is the pH of water?	Single	10
What is the capital of France?	Single	10
What is the derivative of x^2 ?	Multiple	10
what's my name?	Single	10

Pressing reset button will clear all the filters inputted, and also will display the exam lists without any filters on.

Filter Questions

This screenshot is similar to the one above, but the "Filter" button in the top navigation bar is highlighted with a red box. The rest of the interface and data are identical to the previous screenshot.

Exam Name	Course ID	Exam Time	Publish
Midterm Exam	COMP3111	120	yes
Final Exam	COMP3111	180	yes
Midterm Exam	COMP202	120	yes
Final Exam	COMP202	180	yes
Midterm Exam	PHYS101	120	yes
Final Exam	PHYS101	180	yes
Midterm Exam	STAT101	120	yes
Final Exam	STAT101	180	yes
Midterm Exam	CHEM101	120	yes
Final Exam	CHEM101	180	yes
Midterm Exam	MATH202	120	yes
Final Exam	MATH202	180	yes

Question in Exam	Type	Score
No content in table		
What is the rank of a matrix?	Single	10
What is the time complexity of bin...	Single	10
What is Newton's second law?	Multiple	10
What is the pH of water?	Single	10
What is the capital of France?	Single	10
What is the derivative of x^2 ?	Multiple	10
what's my name?	Single	10

On the top right, filter functions for questions are displayed. The user could input a question, select type, or input score. For user friendliness, the user does not have to input the same question for filter, filter function will check whether those inputted values are included in the question and will display that includes those inputs.

WOW Factor: The user does not have to input all the information about the filter. Filtering function will check whether the data contains any of those inputted filters.

Exam Management

Exam Name	Course ID	Exam Time	Publish
Midterm Exam	COMP3111	120	yes
Final Exam	COMP3111	180	yes
Midterm Exam	COMP202	120	yes
Final Exam	COMP202	180	yes
Midterm Exam	PHYS101	120	yes
Final Exam	PHYS101	180	yes
Midterm Exam	STAT101	120	yes
Final Exam	STAT101	180	yes
Midterm Exam	CHEM101	120	yes
Final Exam	CHEM101	180	yes
Midterm Exam	MATH202	120	yes
Final Exam	MATH202	180	yes

Question in Exam	Type	Score
No content in table		

Question	Type	Score
What is the capital of France?	Single	10

Buttons: Delete from left, Add to left

Form fields: Exam Name, Exam Time, Course ID, Publish

Buttons: Delete, Refresh, Add, Update

For example, if France is inputted as Question and filter button is pressed, the all question list on the right will only display those questions that include France in the question.

Exam Management

Exam Name	Course ID	Exam Time	Publish
Midterm Exam	COMP3111	120	yes
Final Exam	COMP3111	180	yes
Midterm Exam	COMP202	120	yes
Final Exam	COMP202	180	yes
Midterm Exam	PHYS101	120	yes
Final Exam	PHYS101	180	yes
Midterm Exam	STAT101	120	yes
Final Exam	STAT101	180	yes
Midterm Exam	CHEM101	120	yes
Final Exam	CHEM101	180	yes
Midterm Exam	MATH202	120	yes
Final Exam	MATH202	180	yes

Question in Exam	Type	Score
No content in table		

Question	Type	Score
No content in table		

Buttons: Delete from left, Add to left

Form fields: Exam Name, Exam Time, Course ID, Publish

Buttons: Delete, Refresh, Add, Update

The user can also input all three, and if there is no matching question that satisfies filter, the table will display No content in table

Reset Question Filter

To reset the question filter, the user has to press Reset Button.

The screenshot shows the 'Exam Management' application interface. At the top, there are input fields for 'Exam Name' (Enter), 'Course ID' (dropdown), 'Publish' (dropdown), 'Reset', 'Filter', 'Question' (Search dropdown), 'Type' (dropdown), 'Score' (dropdown), and buttons for 'Reset' and 'Filter'. Below these are two tables: 'Exam Name' and 'Question in Exam'. The 'Exam Name' table contains 10 rows of exam details. The 'Question in Exam' table has three columns: 'Question in Exam', 'Type', and 'Score', with a note 'No content in table' displayed. At the bottom, there are buttons for 'Delete from left', 'Add to left', and 'Delete', 'Refresh', 'Add', 'Update'.

Pressing Reset button will clear all the inputs in the question filters input fields. It will display the list of all questions.

The screenshot shows the 'Exam Management' application interface after pressing the 'Reset' button. The 'Question' input field is now empty. The 'Question in Exam' table now displays a list of questions with their types and scores. The table includes questions like 'What is the rank of a matrix?', 'What is the time complexity of bin...', 'What is Newton's second law?', etc., each with a 'Single' type and a score of '10'. The 'Question' table at the bottom also lists these questions. The other interface elements remain the same as in the previous screenshot.

This suggests that all the filters for questions is resetted, and table shows all the questions listed in the database

Add Question to Exam

Exam Management

Exam Name	Course ID	Exam Time	Publish
Midterm Exam	COMP3111	120	yes
Final Exam	COMP3111	180	yes
Midterm Exam	COMP202	120	yes
Final Exam	COMP202	180	yes
Midterm Exam	PHYS101	120	yes
Final Exam	PHYS101	180	yes
Midterm Exam	STAT101	120	yes
Final Exam	STAT101	180	yes
Midterm Exam	CHEM101	120	yes
Final Exam	CHEM101	180	yes
Midterm Exam	MATH202	120	yes
Final Exam	MATH202	180	yes

Question in Exam	Type	Score
What is the rank of a matrix?	Single	10
What is the time complexity of bin...	Single	10
What is Newton's second law?	Multiple	10
What is the pH of water?	Single	10
What is the derivative of x^2 ?	Multiple	10

Question	Type	Score
What is the rank of a matrix?	Single	10
What is the time complexity of bin...	Single	10
What is Newton's second law?	Multiple	10
What is the pH of water?	Single	10
What is the capital of France?	Single	10
What is the derivative of x^2 ?	Multiple	10
what's my name?	Single	10

Exam Name: Exam Time: Course ID: Publish

To add a question to the exam, the user must click on the exam on the exam table. As the user clicks on an exam, the selected exam will turn blue, information about the exam will be displayed on exam information fields, and questions included in the exam will be displayed in the middle table.

Exam Management

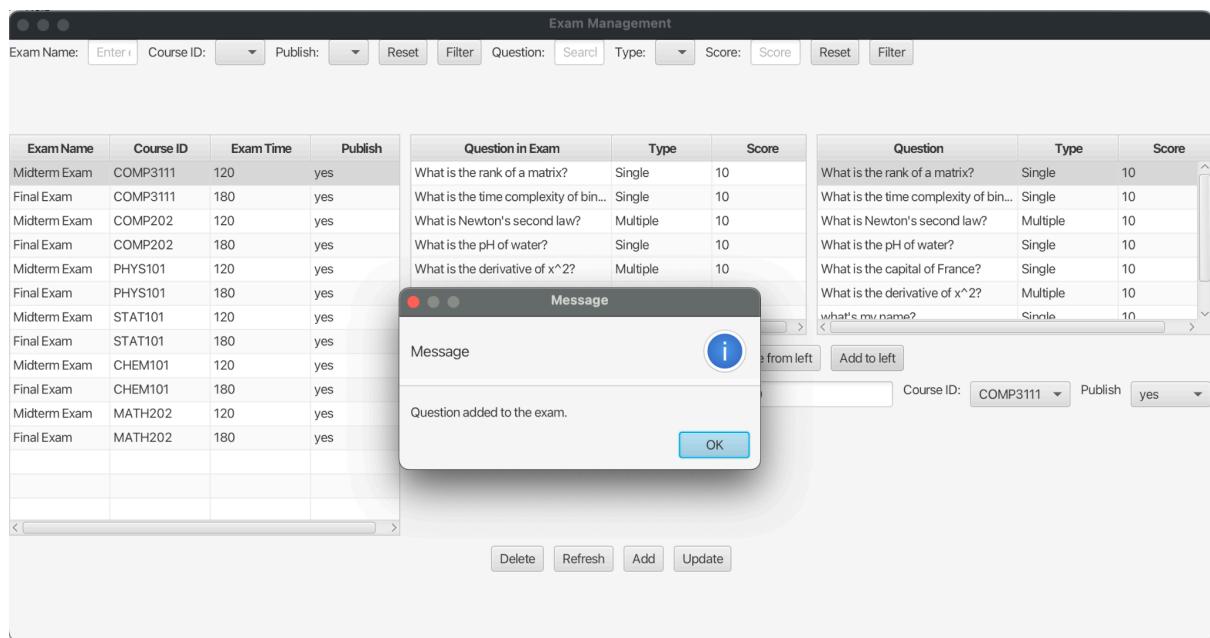
Exam Name	Course ID	Exam Time	Publish
Midterm Exam	COMP3111	120	yes
Final Exam	COMP3111	180	yes
Midterm Exam	COMP202	120	yes
Final Exam	COMP202	180	yes
Midterm Exam	PHYS101	120	yes
Final Exam	PHYS101	180	yes
Midterm Exam	STAT101	120	yes
Final Exam	STAT101	180	yes
Midterm Exam	CHEM101	120	yes
Final Exam	CHEM101	180	yes
Midterm Exam	MATH202	120	yes
Final Exam	MATH202	180	yes

Question in Exam	Type	Score
What is the rank of a matrix?	Single	10
What is the time complexity of bin...	Single	10
What is Newton's second law?	Multiple	10
What is the pH of water?	Single	10
What is the derivative of x^2 ?	Multiple	10

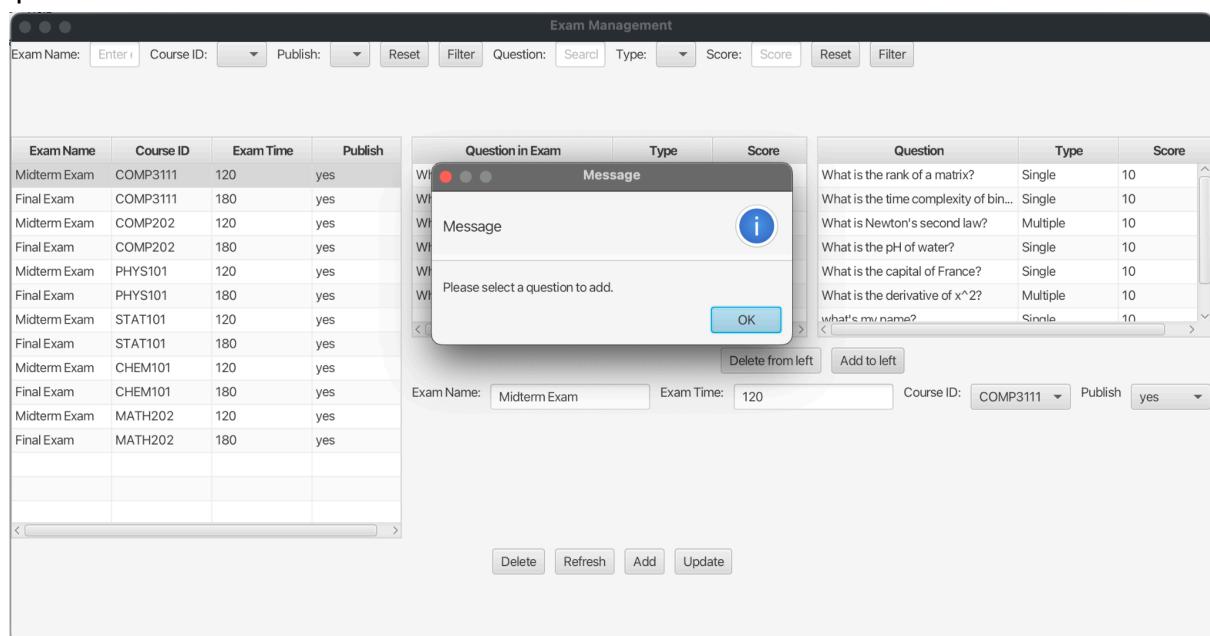
Question	Type	Score
What is the rank of a matrix?	Single	10
What is the time complexity of bin...	Single	10
What is Newton's second law?	Multiple	10
What is the pH of water?	Single	10
What is the capital of France?	Single	10
What is the derivative of x^2 ?	Multiple	10
what's my name?	Single	10

Exam Name: Exam Time: Course ID: Publish

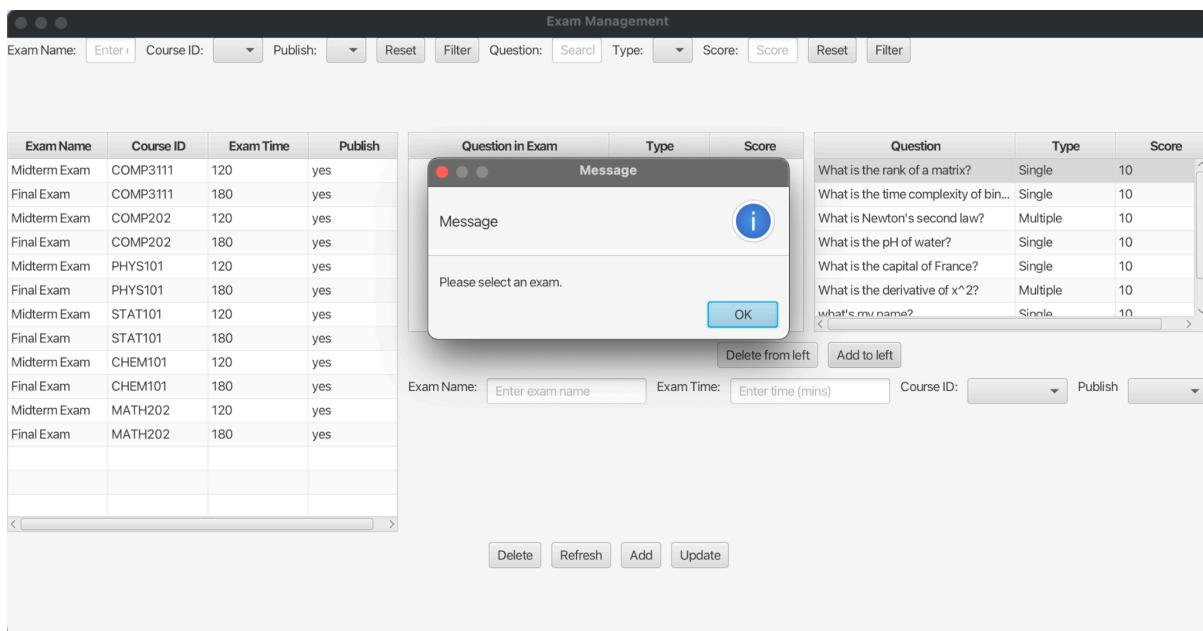
After exam has been selected, the user should select a question to be added to the exam. To add it, the user will click on the question to be added on the right table. As it is clicked, the selected question will turn blue.



After selecting the question to add, click on the Add to left button. It will add the question to the exam, display a pop up saying that Question added to the exam, and it will automatically refresh the tables. The user will be able to see the updated questions list on the middle table.

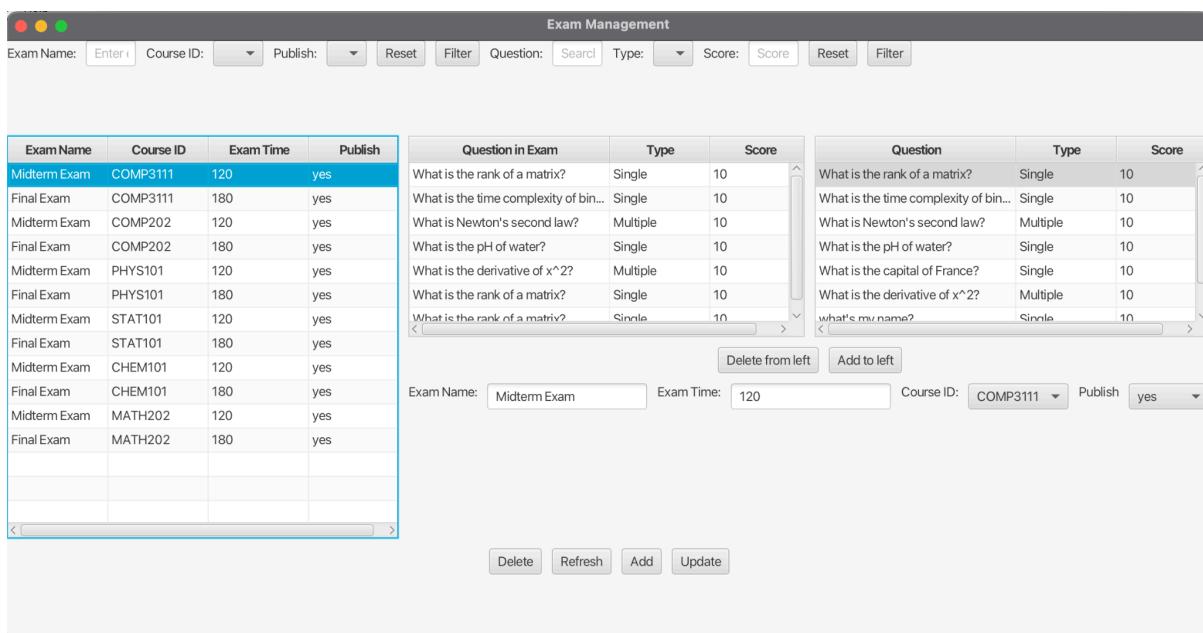


If no question is selected, but Add to left button is pressed, it will display a pop up saying please select a question to add.



If no exam is selected, but the Add to left button is pressed, it will display a pop up saying please select an exam.

Remove Question from Exam



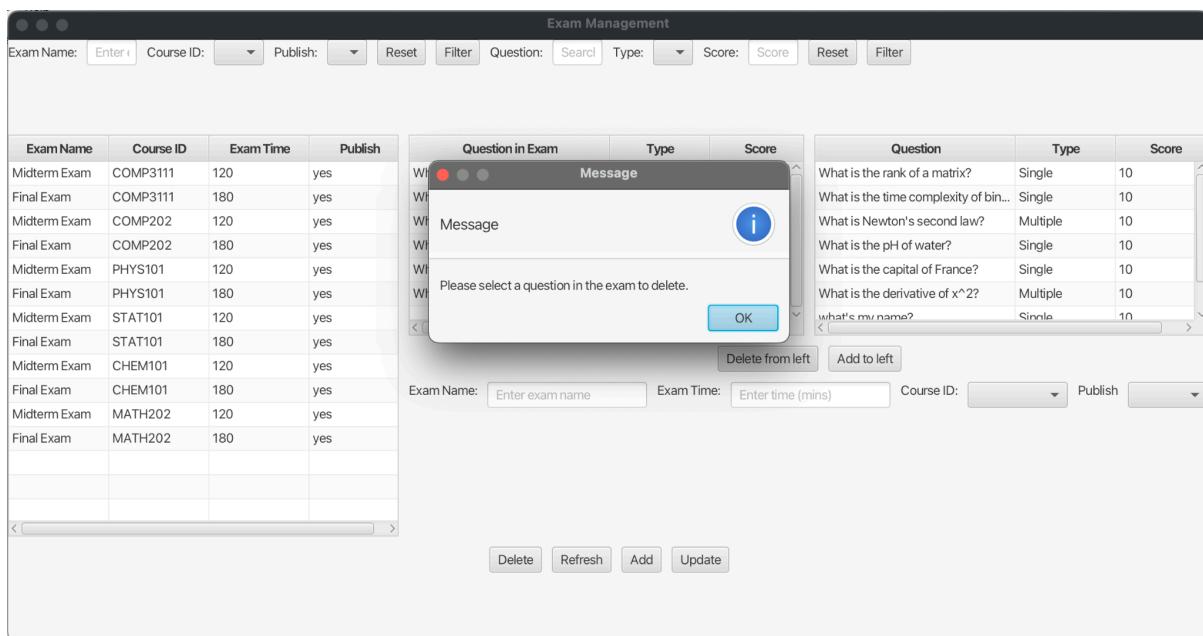
To remove a question from an exam, the user must select an exam that the user wants to remove the question from. The user should click on the exam on the left table. After it has been selected, the selected exam will turn blue, information about the exam will be displayed on exam information fields, and questions included in the exam will be displayed in the middle table.

The screenshot shows the 'Exam Management' application interface. At the top, there are search and filter fields for 'Exam Name', 'Course ID', 'Publish', 'Reset', and 'Filter'. Below these are two tables. The left table lists exams with columns: Exam Name, Course ID, Exam Time, and Publish. The right table lists questions with columns: Question, Type, and Score. A specific question, 'What is the time complexity of bin...', is highlighted in blue in the middle table, indicating it is selected for removal.

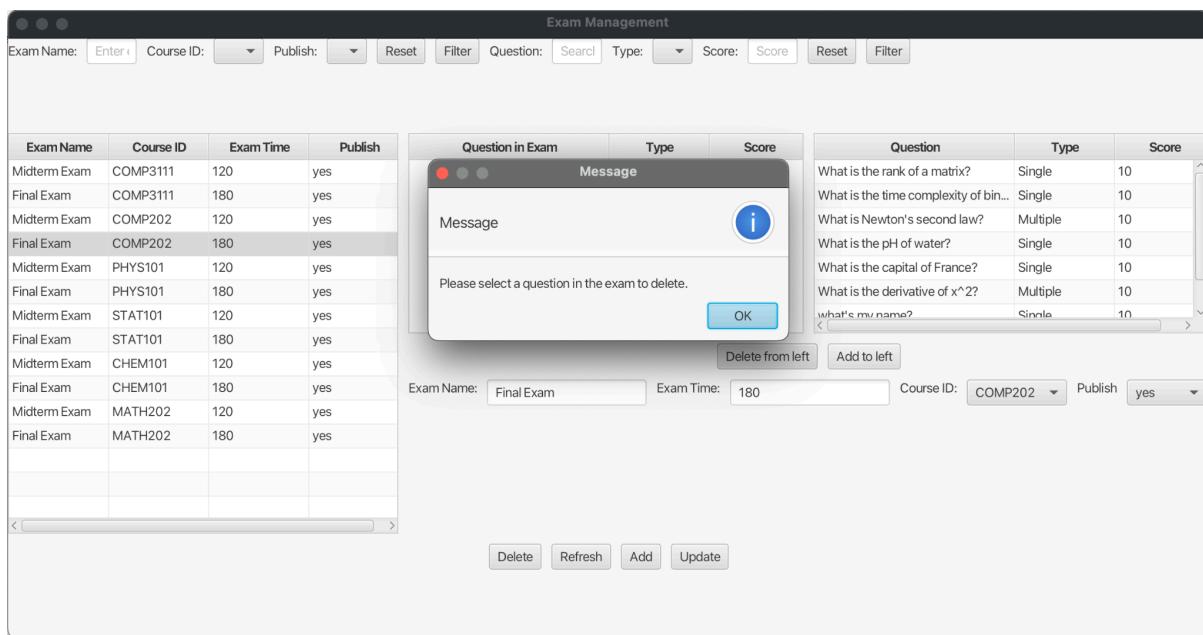
After selecting the exam to remove a question from, to remove a question from the selected exam, the user should select the question to remove in the table in the middle. After it has been selected, the selected question to remove will turn blue.

The screenshot shows the 'Exam Management' application interface. A confirmation dialog box titled 'Message' is displayed in the center, stating 'Question removed from the exam.' with an 'OK' button. The background tables are visible but appear unchanged from the previous screenshot.

After the question to be removed is selected, the user should press Delete from left to remove the selected question from the exam. It will remove the question from the exam and display a pop up saying that Question removed from the exam. After pressing ok or closing the popup, the user will see a refreshed middle table.



If there is no exam selected, but the user pressed Delete from left button, the system will display a popup saying that Please select a question in the exam to delete, and will return back.



If there is no question selected, but the user pressed Delete from left button, the system will display a popup saying that Please select a question in the exam to delete, and return back.

Add Exam

Exam Management

Exam Name	Course ID	Exam Time	Publish
Midterm Exam	COMP3111	120	yes
Final Exam	COMP3111	180	yes
Midterm Exam	COMP202	120	yes
Final Exam	COMP202	180	yes
Midterm Exam	PHYS101	120	yes
Final Exam	PHYS101	180	yes
Midterm Exam	STAT101	120	yes
Final Exam	STAT101	180	yes
Midterm Exam	CHEM101	120	yes
Final Exam	CHEM101	180	yes
Midterm Exam	MATH202	120	yes
Final Exam	MATH202	180	yes

Question in Exam

Question	Type	Score
No content in table		
What is the rank of a matrix?	Single	10
What is the time complexity of bin...	Single	10
What is Newton's second law?	Multiple	10
What is the pH of water?	Single	10
What is the capital of France?	Single	10
What is the derivative of x^2 ?	Multiple	10
what's my name?	Single	10

Question

Question	Type	Score
What is the rank of a matrix?	Single	10
What is the time complexity of bin...	Single	10
What is Newton's second law?	Multiple	10
What is the pH of water?	Single	10
What is the capital of France?	Single	10
What is the derivative of x^2 ?	Multiple	10
what's my name?	Single	10

Add Question

Exam Name: Enter exam name Exam Time: Enter time (mins) Course ID: Publish

Action Buttons

Delete from left Add to left

Bottom Buttons

Delete Refresh Add Update

To add an exam, the user must press Refresh button, then input all the fields in this part in the red. Exam name is the exam name, Exam time is in minutes, Course ID will be given a list of courses on Examination System, and whether it is published or not.

Exam Management

Exam Name	Course ID	Exam Time	Publish
Midterm Exam	COMP3111	120	yes
Final Exam	COMP3111	180	yes
Midterm Exam	COMP202	120	yes
Final Exam	COMP202	180	yes
Midterm Exam	PHYS101	120	yes
Final Exam	PHYS101	180	yes
Midterm Exam	STAT101	120	yes
Final Exam	STAT101	180	yes
Midterm Exam	CHEM101	120	yes
Final Exam	CHEM101	180	yes
Midterm Exam	MATH202	120	yes
Final Exam	MATH202	180	yes

Question in Exam

Question	Type	Score
No content in table		
What is the rank of a matrix?	Single	10
What is the time complexity of bin...	Single	10
What is Newton's second law?	Multiple	10
What is the pH of water?	Single	10
What is the capital of France?	Single	10
What is the derivative of x^2 ?	Multiple	10
what's my name?	Single	10

Question

Question	Type	Score
What is the rank of a matrix?	Single	10
What is the time complexity of bin...	Single	10
What is Newton's second law?	Multiple	10
What is the pH of water?	Single	10
What is the capital of France?	Single	10
What is the derivative of x^2 ?	Multiple	10
what's my name?	Single	10

Add Question

Exam Name: exemple Exam Time: 120 Course ID: MATH202 Publish

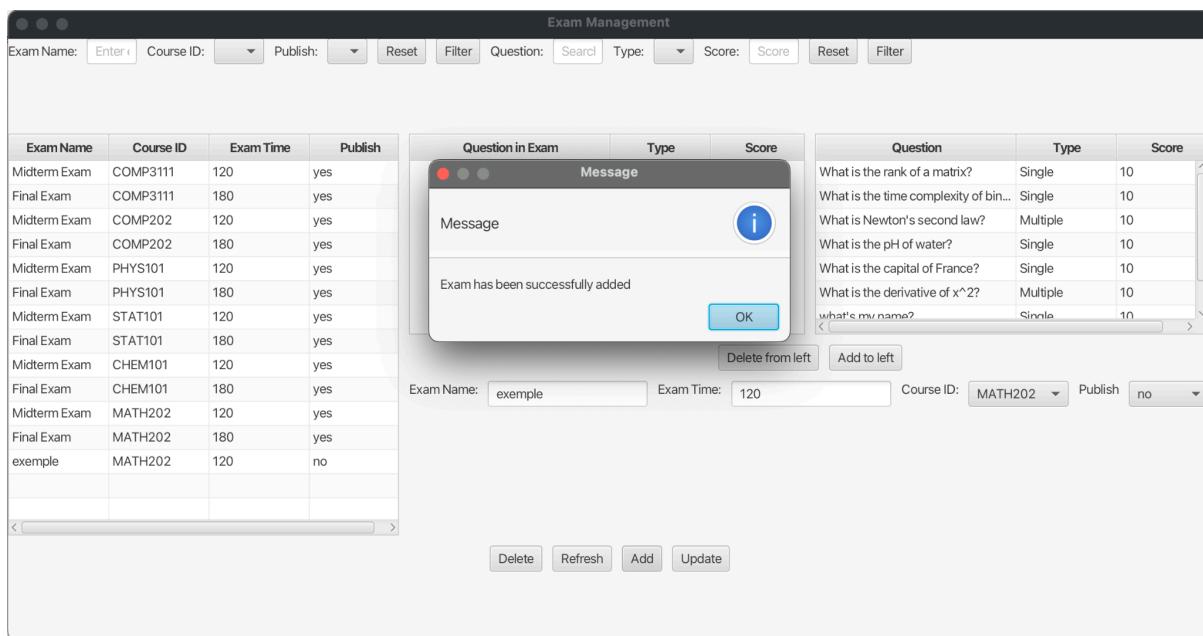
Action Buttons

Delete from left Add to left

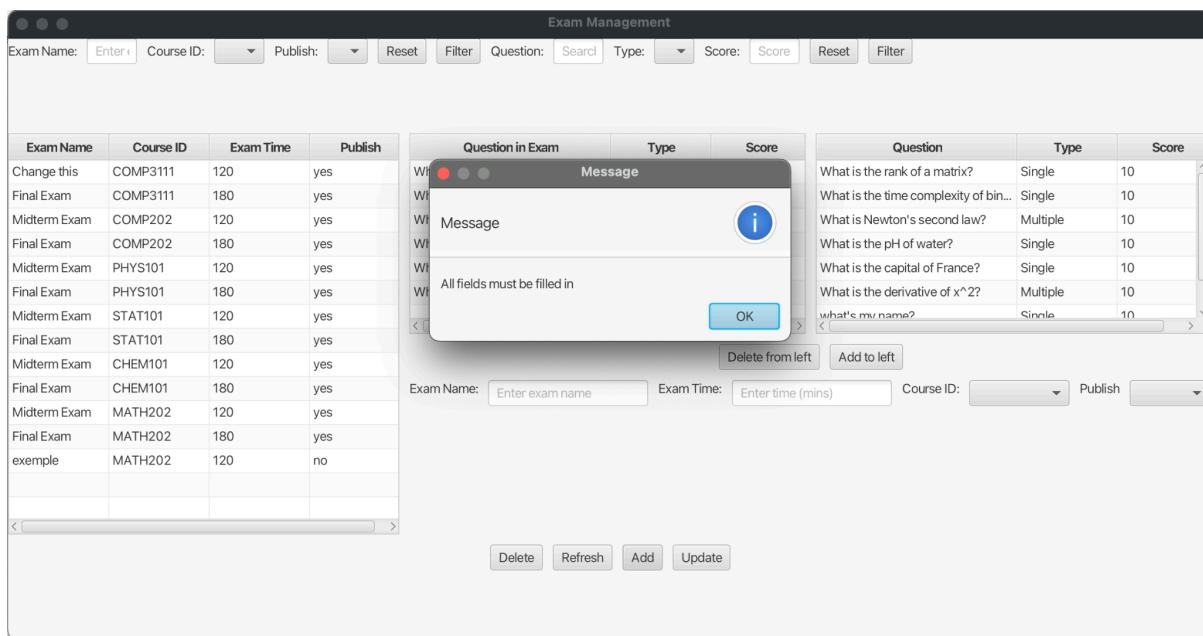
Bottom Buttons

Delete Refresh Add Update

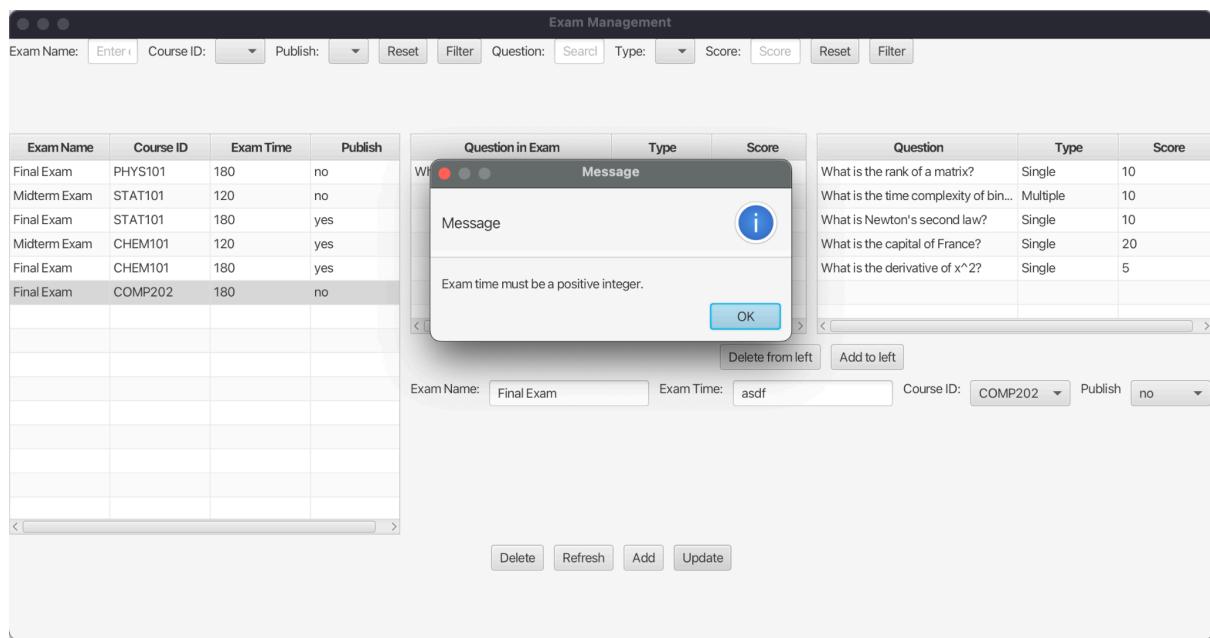
After inputting all the information to the fields, the user should press the Add button that is at the bottom.



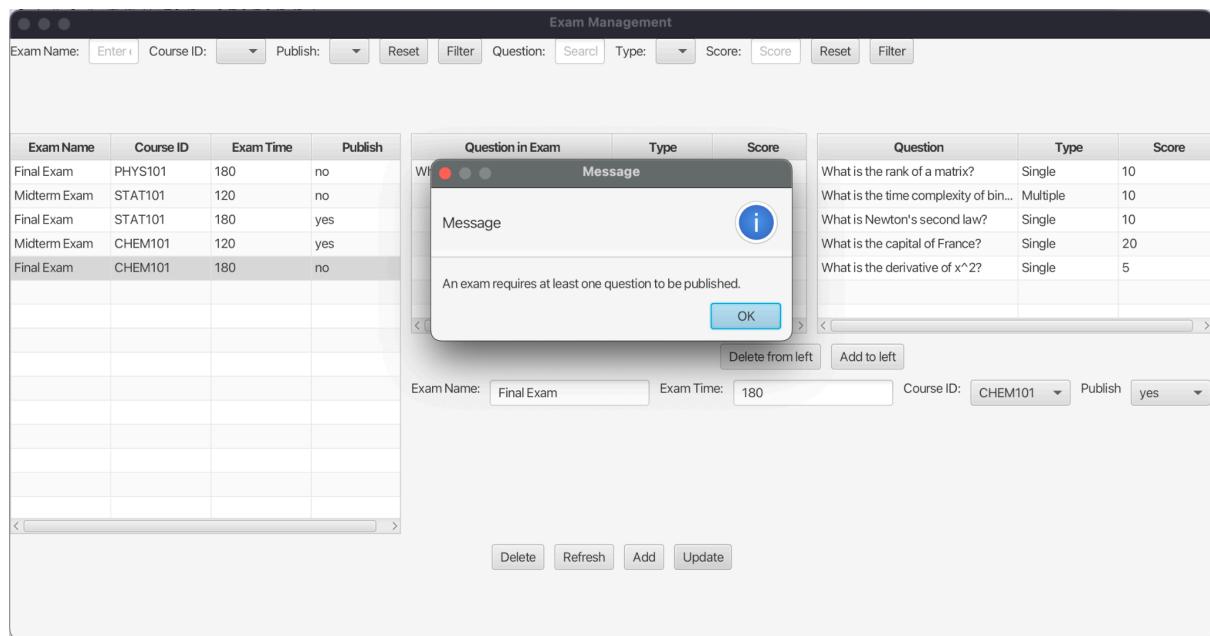
If it meets all the requirements for exam creation criteria, it will add the exam to the database and will display a pop up saying that Exam has been successfully added. It will automatically refresh as the user closes the popup. The user will be able to see the added exam on the left table.



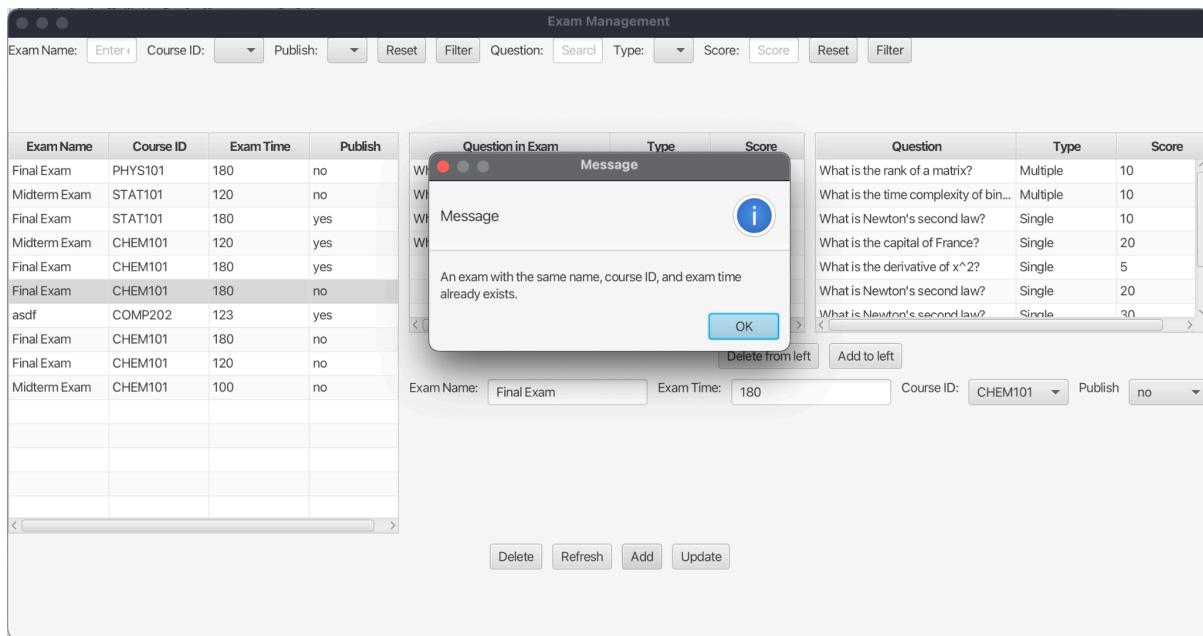
If it is missing some information fields, it will display a pop up saying that all fields must be filled in, and the user will be sent back to the page to fill in all the necessary information.



If it has negative or other values than integer in Exam Time, it will show this popup, and the user will be sent back to the page to fill in all the necessary information

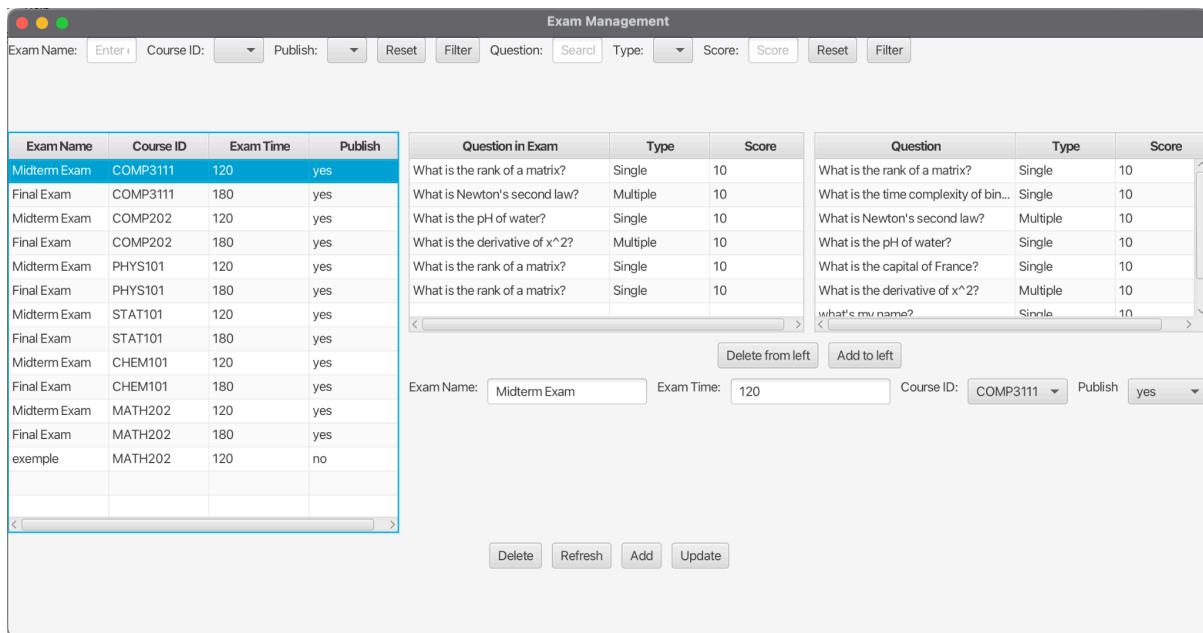


if the user tries to publish it, but the exam doesn't have any question included, it will show this popup,



If the user tries to create an exam that has the same credentials, it will show this popup.

Update Exam



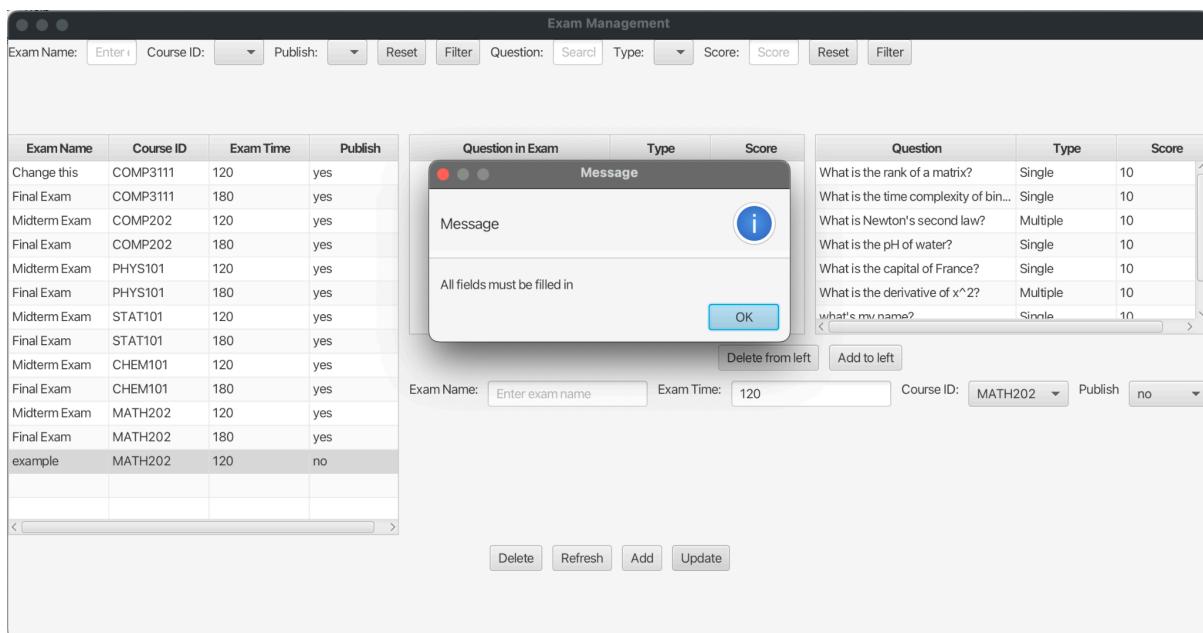
To update the exam, the user must select the exam on the right table by clicking on the exam to update. When the user selects an exam, it will display questions included in exam in the middle table, information in the exam information fields, and turn the selected exam to blue.

The screenshot shows the 'Exam Management' application interface. On the left, there is a table of exams with columns: Exam Name, Course ID, Exam Time, and Publish. One row is selected, showing 'Change this' in the Exam Name field, '120' in Exam Time, and 'yes' in Publish. In the center, there is a table titled 'Question in Exam' with columns: Question, Type, and Score. A question 'What is the rank of a matrix?' is selected. On the right, there is another table titled 'Question' with columns: Question, Type, and Score. A question 'What is the capital of France?' is selected. At the bottom, there are buttons for Delete, Refresh, Add, and Update.

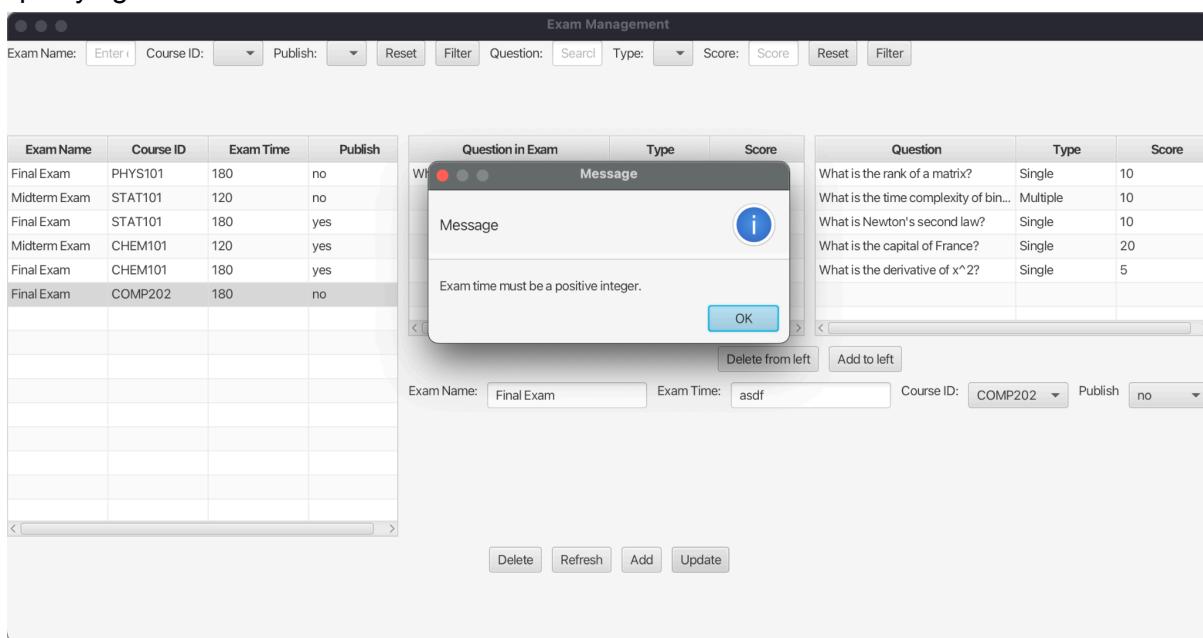
After selecting the exam to update, the user can change the information about the exam by modifying the exam information fields. Then the user should press Update button on the bottom.

The screenshot shows the 'Exam Management' application interface. A message dialog box is centered on the screen with the title 'Message' and a blue information icon. The message text says 'Exam has been successfully updated'. At the bottom of the dialog is an 'OK' button. The background shows the same tables and fields as the previous screenshot, with the 'Change this' value now updated to 'Enter exam name'.

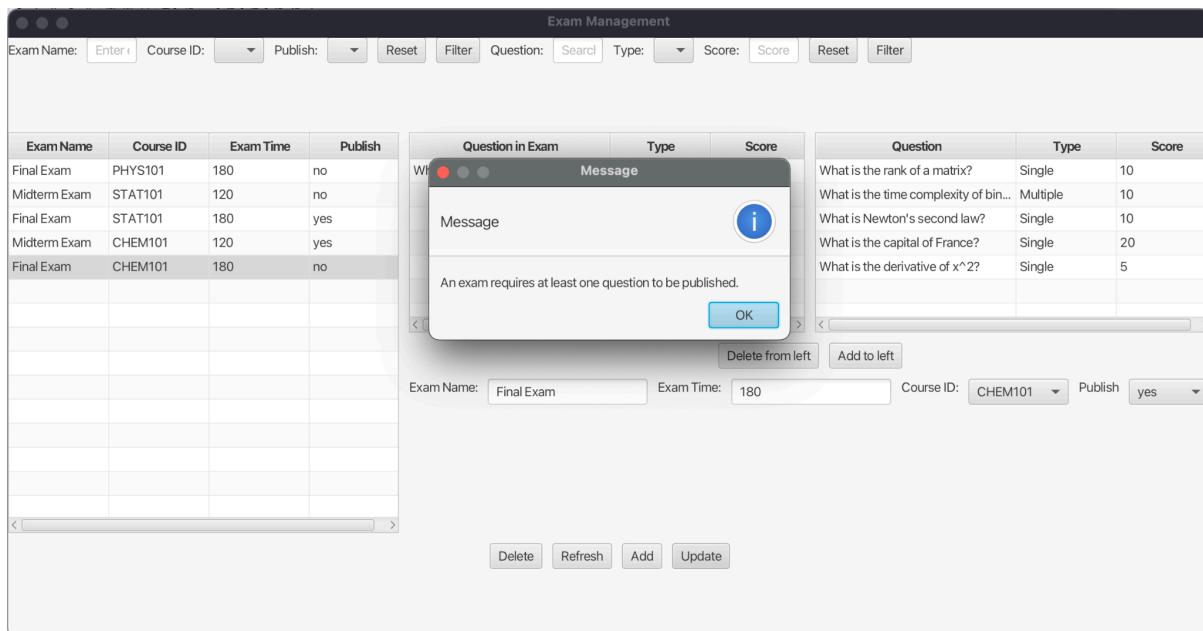
If updated information meets all the requirements, it will modify the database to adjust that information, and will display a pop up saying Exam has been successfully uploaded, and as the user closes pop up, it will refresh the page.



If it doesn't meet the requirement, such as not having all the information, it will display a pop up saying that All fields must be filled in.

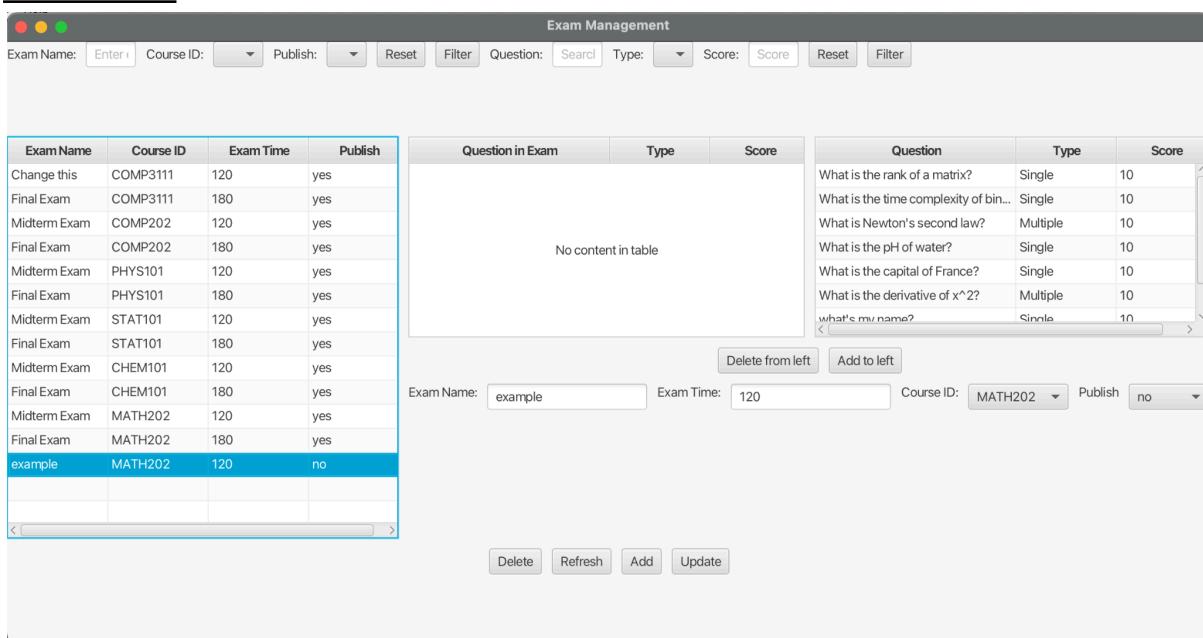


If it has negative or other values than integer in Exam Time, it will show this popup, and the user will be sent back to the page to fill in all the necessary information



if the user tries to publish it, but the exam doesn't have any question included, it will show this popup,

Delete Exam



To delete an exam, the user must select the exam on the right table by clicking on the exam to update. When the user selects an exam, it will display questions included in exam in the middle table, information in the exam information fields, and turn the selected exam to blue.

The screenshot shows the 'Exam Management' application interface. On the left, there is a table listing various exams with columns for Exam Name, Course ID, Exam Time, and Publish status. One row, 'example', has its 'Publish' status set to 'no'. In the center, there is a table titled 'Question in Exam' with columns for Question, Type, and Score. A message 'No content in table' is displayed. On the right, another table lists individual questions with columns for Question, Type, and Score. A specific question, 'what's my name?', is highlighted. At the bottom, there are several buttons: 'Delete from left', 'Add to left', 'Delete', 'Refresh', 'Add', and 'Update'.

After selecting an exam to delete, the user should press the Delete button to delete the selected exam.

The screenshot shows the 'Exam Management' application interface. The 'example' exam row from the previous screen is now highlighted with a red border, indicating it is selected for deletion. A modal dialog box titled 'Message' is centered on the screen, displaying the text 'Exam has been successfully deleted' with an 'OK' button. The background tables and other controls are visible but dimmed.

It will delete all the details about exam such as questions included, information, and grades of the students from the database. It will display a pop up saying that Exam has been successfully deleted.

Refresh

The screenshot shows a Java Swing application titled "Exam Management". The interface includes a toolbar with buttons for "Enter", "Course ID", "Publish", "Reset", "Filter", "Question", "Search", "Type", "Score", and "Filter". Below the toolbar are two tables. The left table lists exams with columns: Exam Name, Course ID, Exam Time, and Publish. The right table lists questions with columns: Question in Exam, Type, and Score. A message "No content in table" is displayed in the center. At the bottom are buttons for "Delete from left", "Add to left", and "Delete", "Refresh", "Add", "Update". There are also input fields for "Exam Name", "Exam Time (mins)", "Course ID", and "Publish".

Exam Name	Course ID	Exam Time	Publish
Change this	COMP3111	120	yes
Final Exam	COMP3111	180	yes
Midterm Exam	COMP202	120	yes
Final Exam	COMP202	180	yes
Midterm Exam	PHYS101	120	yes
Final Exam	PHYS101	180	yes
Midterm Exam	STAT101	120	yes
Final Exam	STAT101	180	yes
Midterm Exam	CHEM101	120	yes
Final Exam	CHEM101	180	yes
Midterm Exam	MATH202	120	yes
Final Exam	MATH202	180	yes

Question	Type	Score
What is the rank of a matrix?	Single	10
What is the time complexity of bin...	Single	10
What is Newton's second law?	Multiple	10
What is the pH of water?	Single	10
What is the capital of France?	Single	10
What is the derivative of x^2 ?	Multiple	10
what's my name?	Single	10

To refresh the system, the user can press the refresh button at the bottom. Pressing Refresh button will

Task 3: Wong Hon Yin

Files I implemented:

Controllers:

ManagerCourseManagementController.java
ManagerCourseRegManagementController.java
ManagerStudentManagementController.java
ManagerTeacherManagementController.java
ManagerLoginController.java
ManagerMainController.java
TeacherGradeStatisticController.java

Service:

CourseManagementService.java
CourseRegistrationRecordService.java
StudentManagementService.java
TeacherManagementService.java

Entities:

Course.java
CourseRegRecord.java
Exam.java
Grade.java
Manager.java
Student.java
Teacher.java

Database:

DatabaseService.java

Limitations For Task 3:

The user **MUST** input the data by using the system to ensure there is no data that is incorrect.

You can try using the data provided in github to ensure there are no corruption for the data inputted in other classes, or self made data that are incorrect

Any incorrect input/implications from task 1 or task 2 or incorrect input by changing the database .txt files WILL CRASH the system.

Reason: For teacher Grade statistics/Course Management/Student Management/Teacher Management/Course Registration Management system in Task 3, fetch data from the database, and search data by super id in order to filter Or show the data from the database.

As an example, if you change the .txt file or other class has a wrong implementation causing a wrong format for the database data has been saved into the txt file. Like Grade class, which have studentId(key of student entity) and examId(key of exam entity) if other task or the txt file has corrupted, when showing the data in the table for getting the exam name, course name using these ids will be null, which will lead to the database won't be able to find the data corresponding to the request.

Assumptions For Task 3:

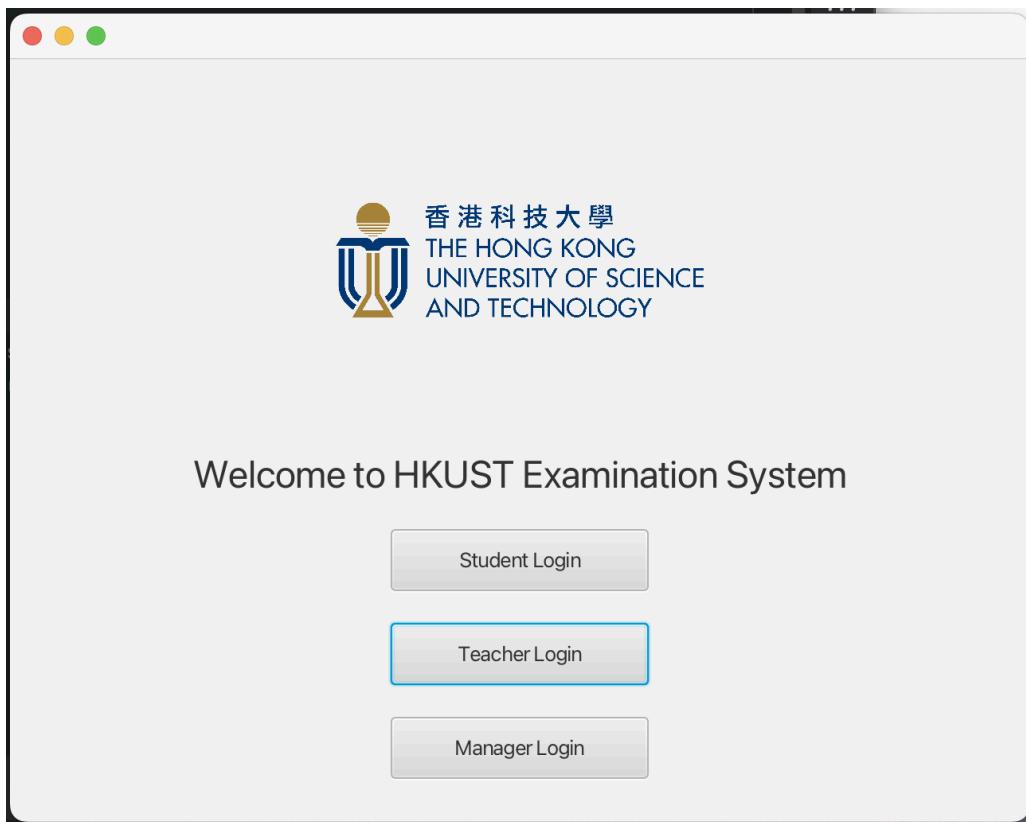
We assume students can only take exams for the courses that they have registered for. Therefore, there is an **EXTRA UI for course registration and dropping courses**. To ensure students will not attend the wrong exam in task 1. (Details of the function are shown below. In the **EXTRA: Course Register Management System** section)

Below, it will show all specific Task 3 input output Screenshots, characteristics, WoW factors and analysis of the algorithms.

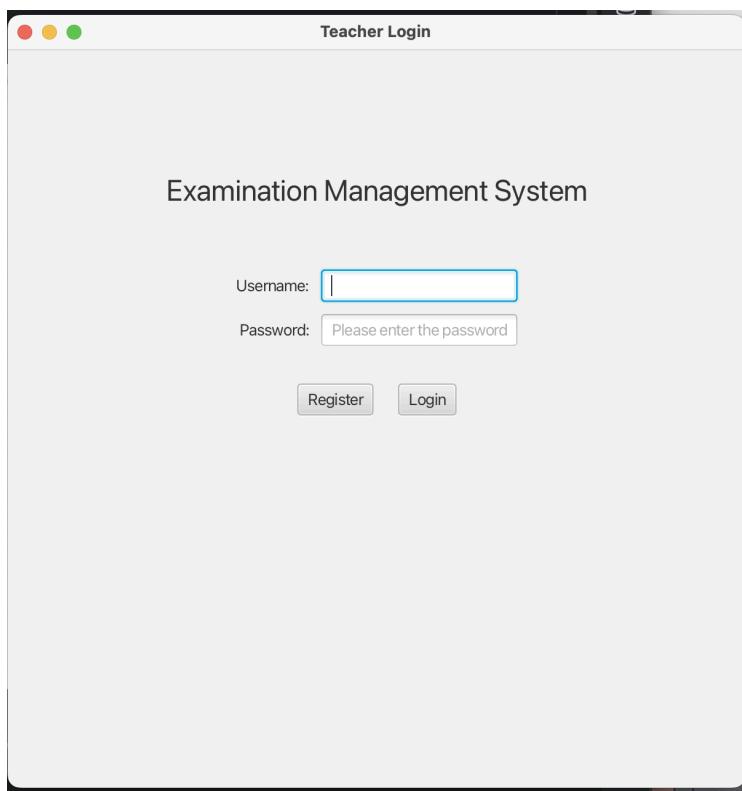
Teacher Grade Statistics System:

From the main screen

Click the Teacher Login button to access the Teacher Management Main UI (Done in Task 2):



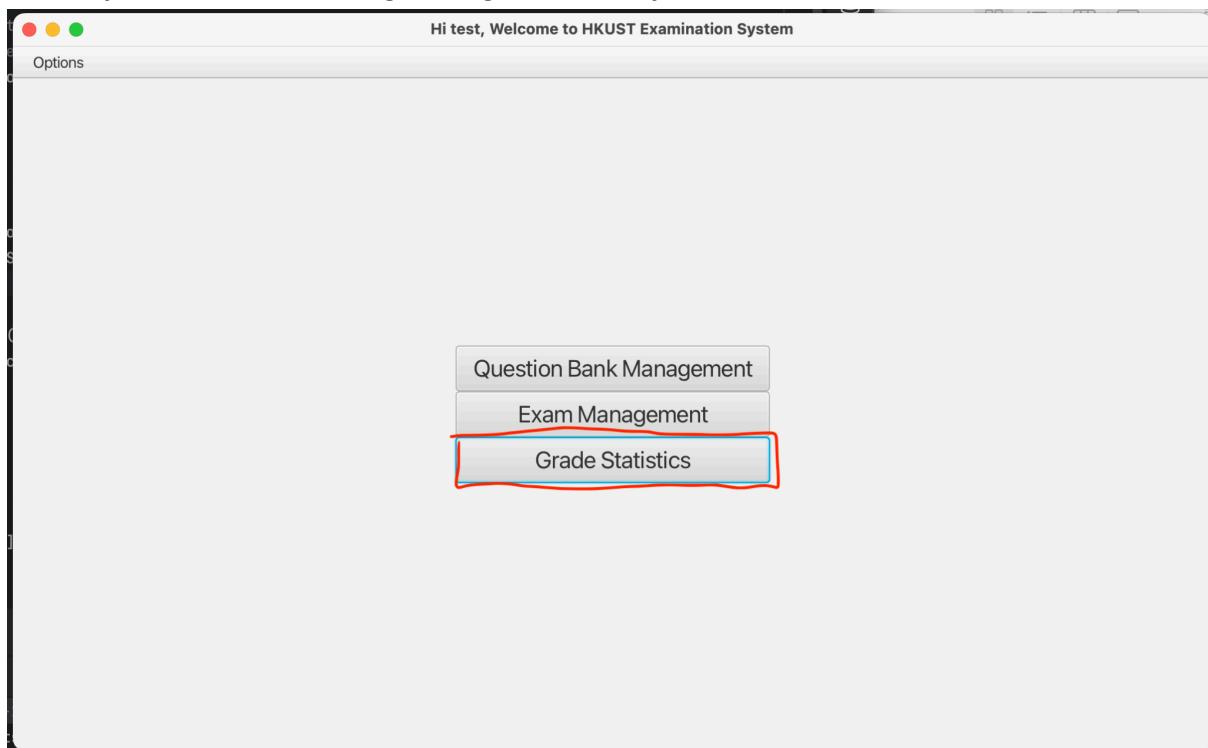
And login to a teacher account (Done in Task 2):



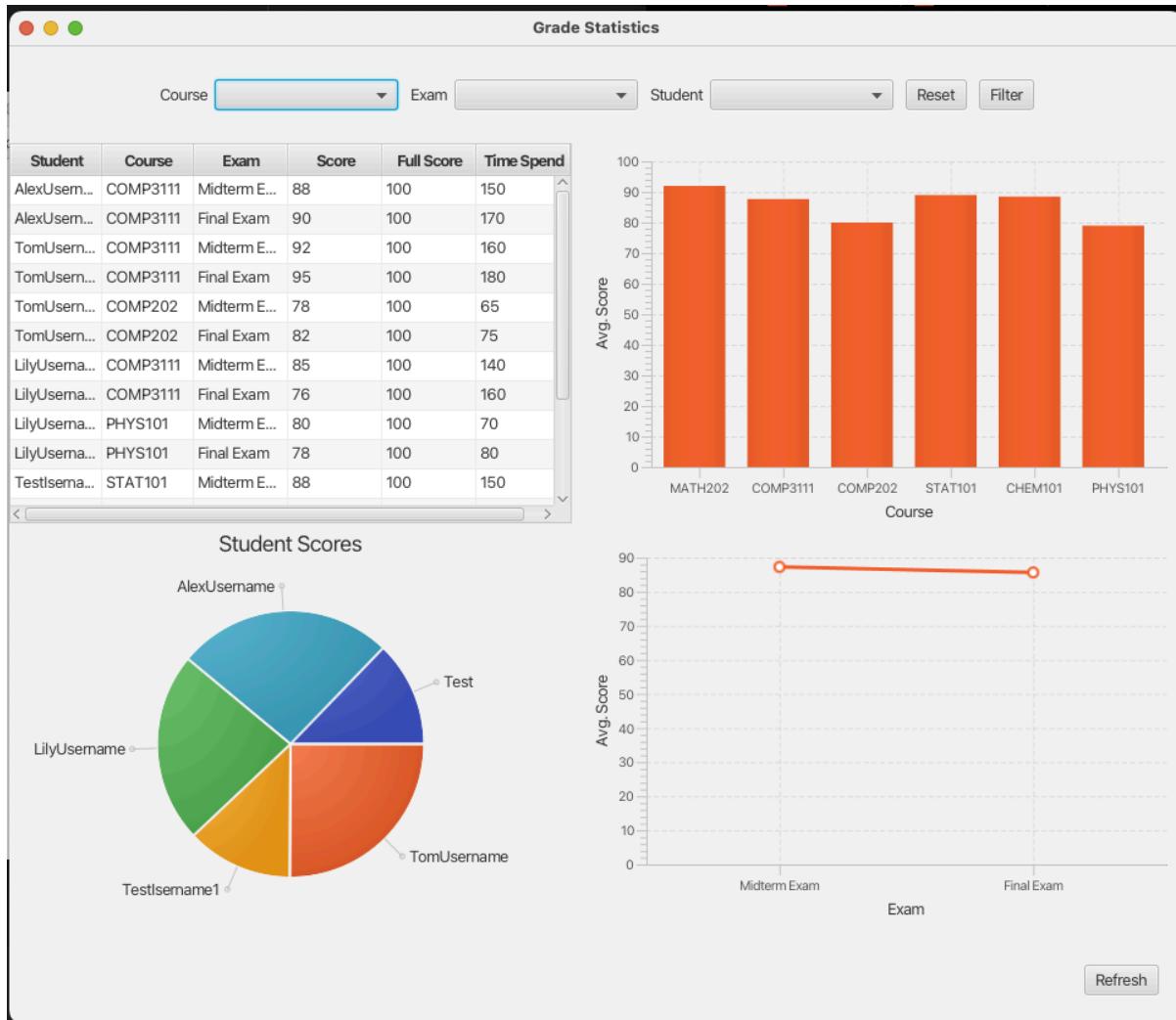
After the user has logged in to the teacher system:

TASK 3.1: Handling the Grade Statistics:

When you click on Manager Login button, you will see this screen:



To check all the grades of students and courses, click the Grade Statistics button marked above, and the Teacher Grade Statistics page will show up:



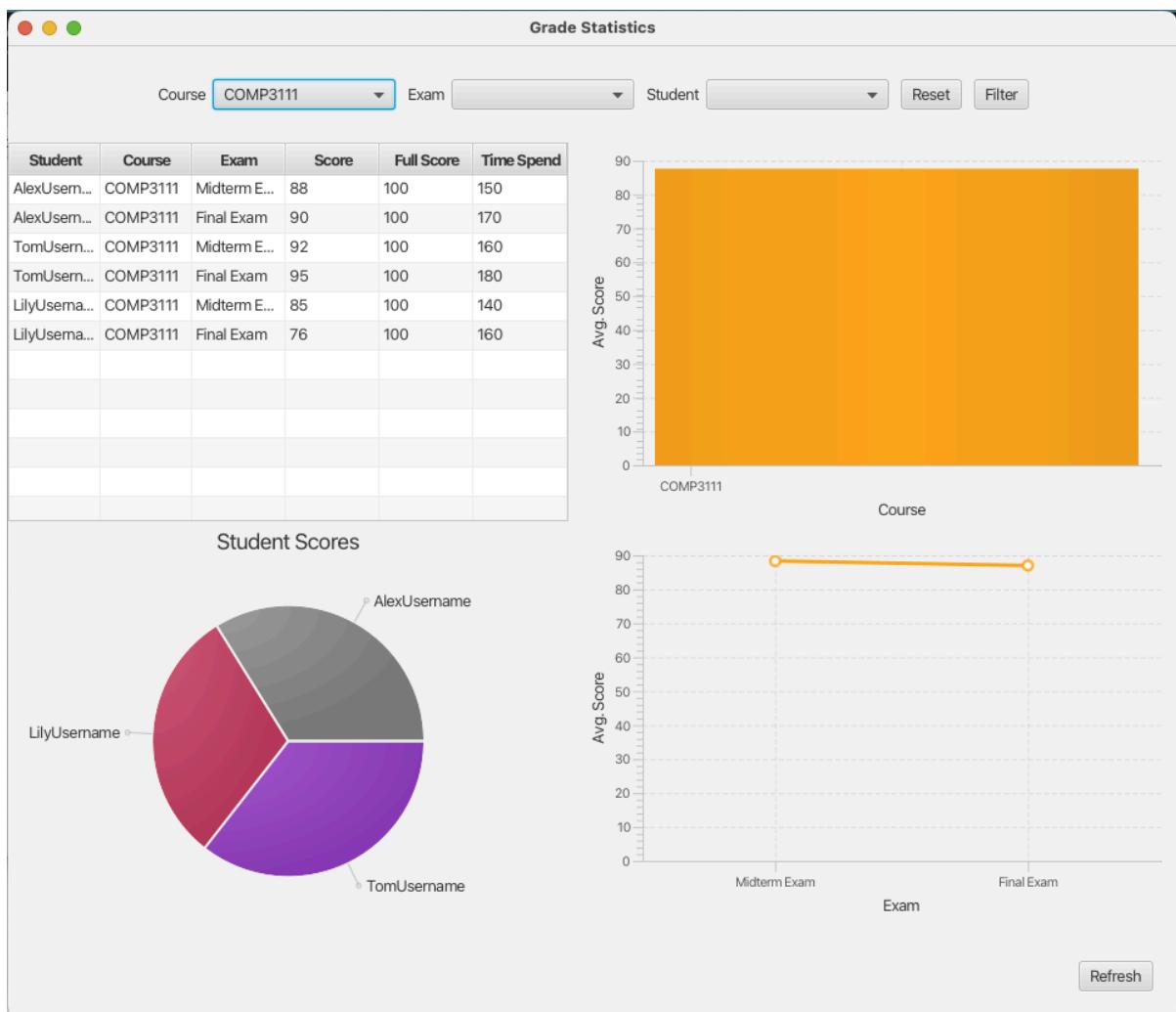
It will show all statistics from the student grade data, and transform them into graphs.

For the table in the left it will show all the student's grade record
The right column graph will show all average scores of the courses selected.
The bottom left chart graph will show all student's scores in the course selected.

And the right line graph can see how the student acts on different exams.

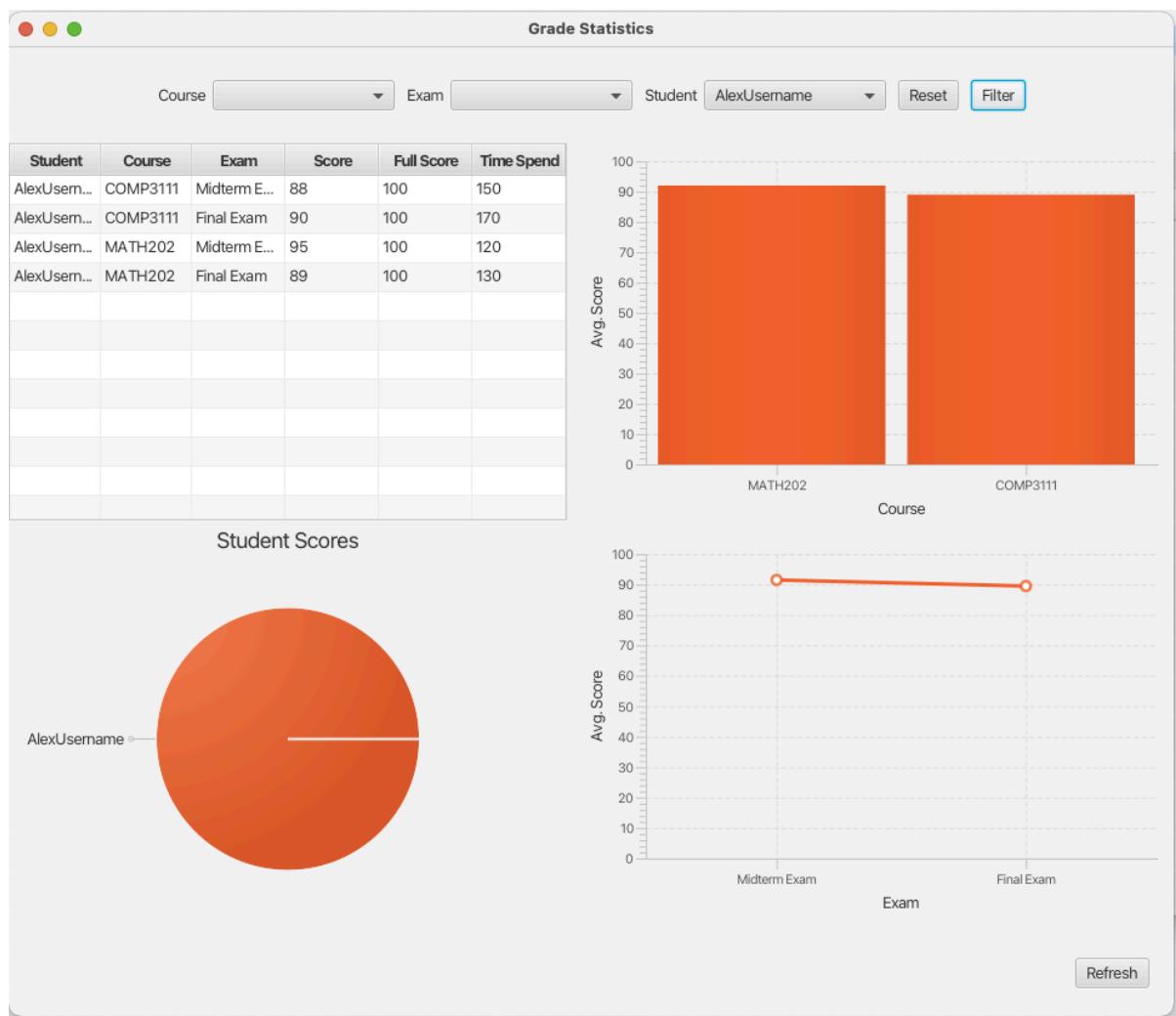
How to Use:

As a example, the user want to find out the grades for COMP3111:



Here we can see the performance for the student has decreased if compare midterm to final exam, and we can also see the overall performance of different students in the class and the average score of the class.

Another Example, the user want to compare how student Alex act for grades:

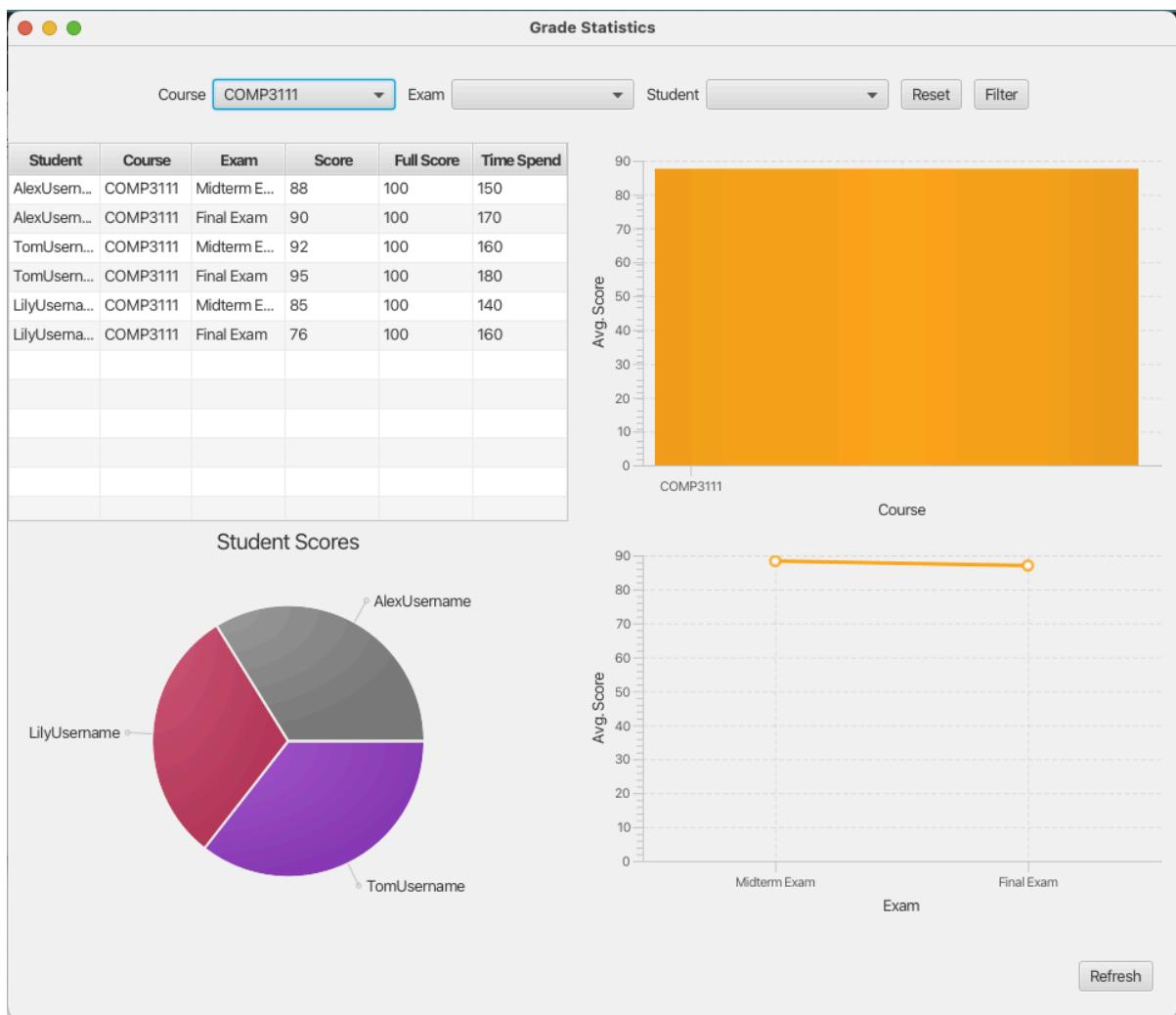


Here we can see overall she did better in MATH202 than COMP3111, and she did better in midterm than in the final exam.

Filter and Reset Filters:

To Filter out the data of the table and the data shown form the graph, the user needs to first select Course, Exam or Student for the target i want to filter, and press the Filter Button.

For example, The user wants to find out the grade for COMP3111:



If the user wants to reset the filter, just press the Reset button next to the Filter Button. It will refresh the screen and reset the filter.

Algorithms for filter Grade Statistics:

Set Up:

We set up an entity only for the grades, which will contain the key of student and exam. So that when we are filtering the data, we can trace the data for each grade, as if we filter the course, we can use the exam key to trace its course name by calling out the exam database and use the queryByKey function to get the exam out and read what is the course binding to it.

Filter:

To filter the list of data of Grade, first i fetch the data out, and put all data into a List, then Loop through all grade in the List, and set up a boolean values “matches = true” if any of the statement are not match and not null, then turn

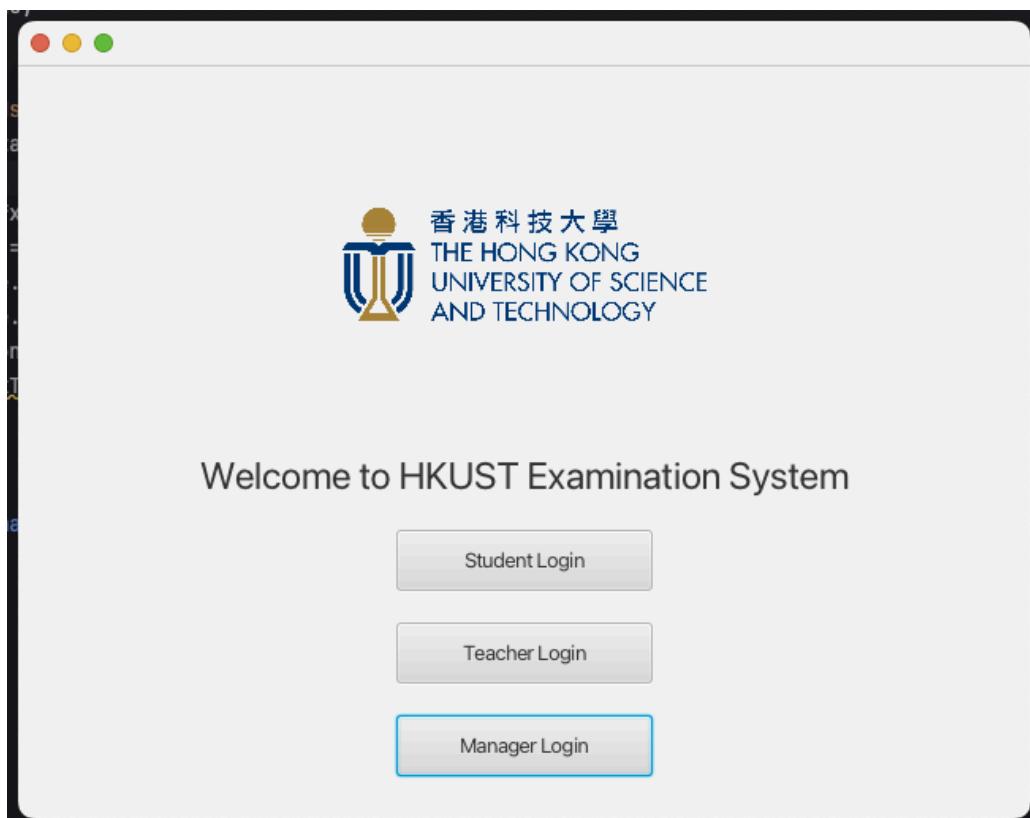
un match, at last if it is matches then add the grade to the observable List and output to the UI.

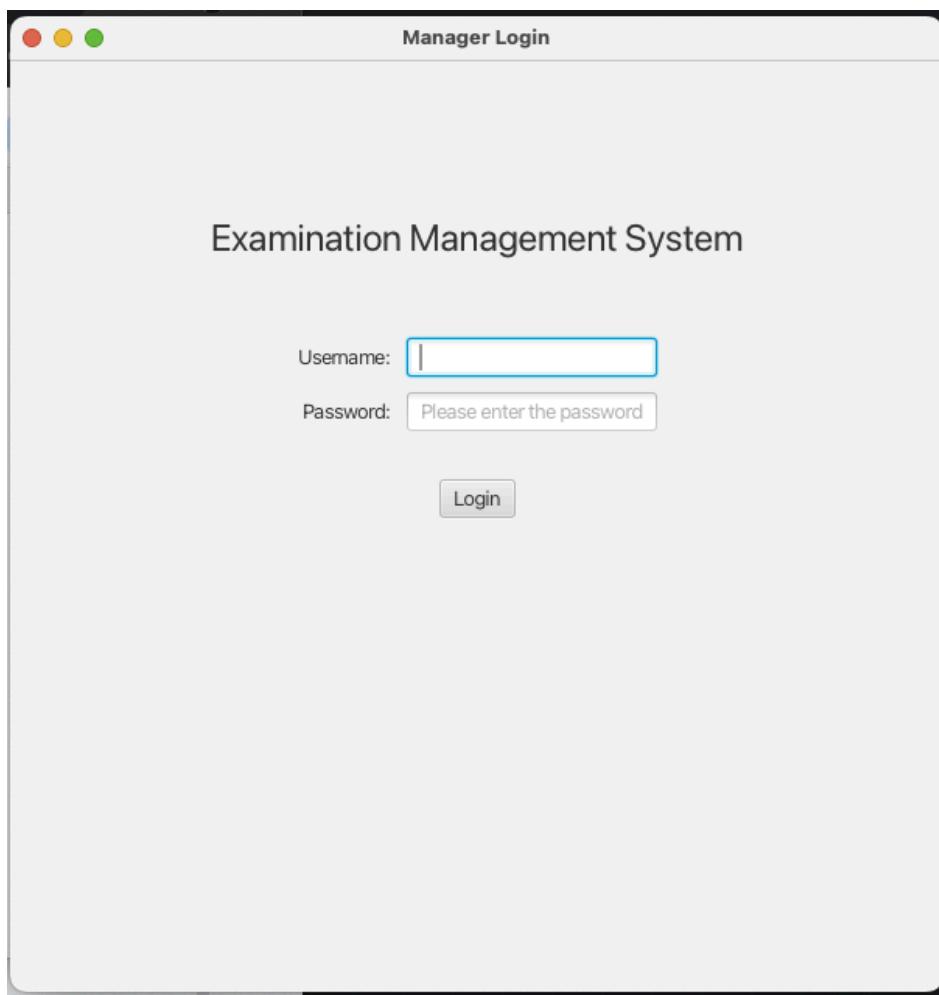
Refresh Screen:

The refresh button will ONLY refresh the table data, but not the table, as for considerations of if there is a lot of data inside the table, it will be user not friendly if the refresh button refreshes the filter, so users need to re-input the filter after refreshing the screen.

Manager:

From the main screen:





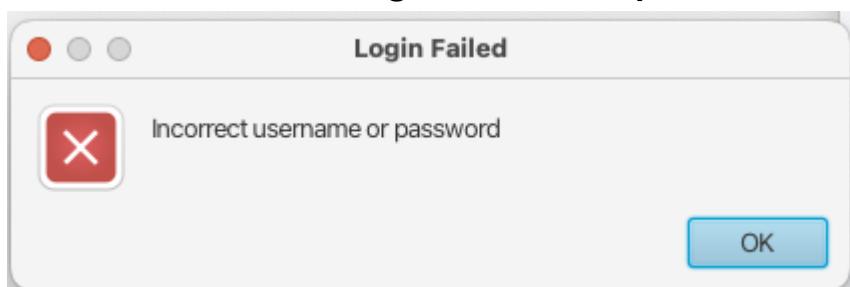
The user need to fill in the **username** and **password** for the manager
If he **did not fill in anything**, this will pop out:



If the user **only fill in password or only username**:



If the user fill in the **wrong username or password**:



When the user entered the **correct username and password**

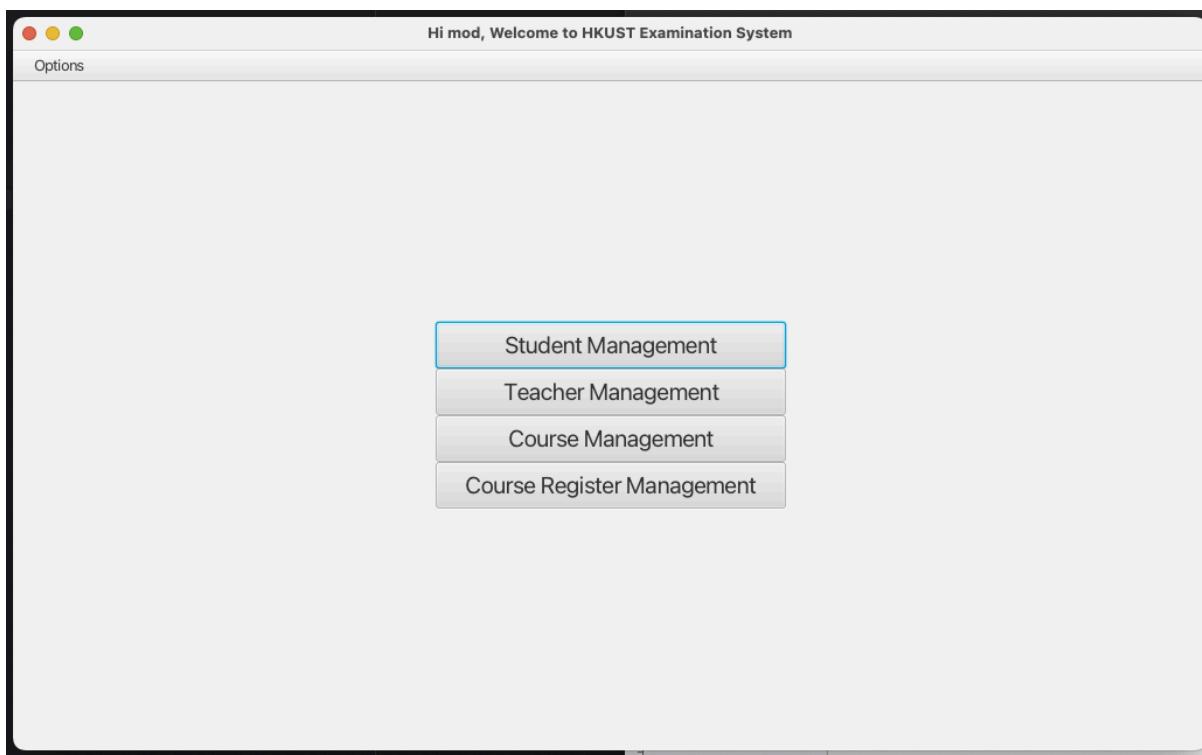
Username: **mod**

Password: **password**

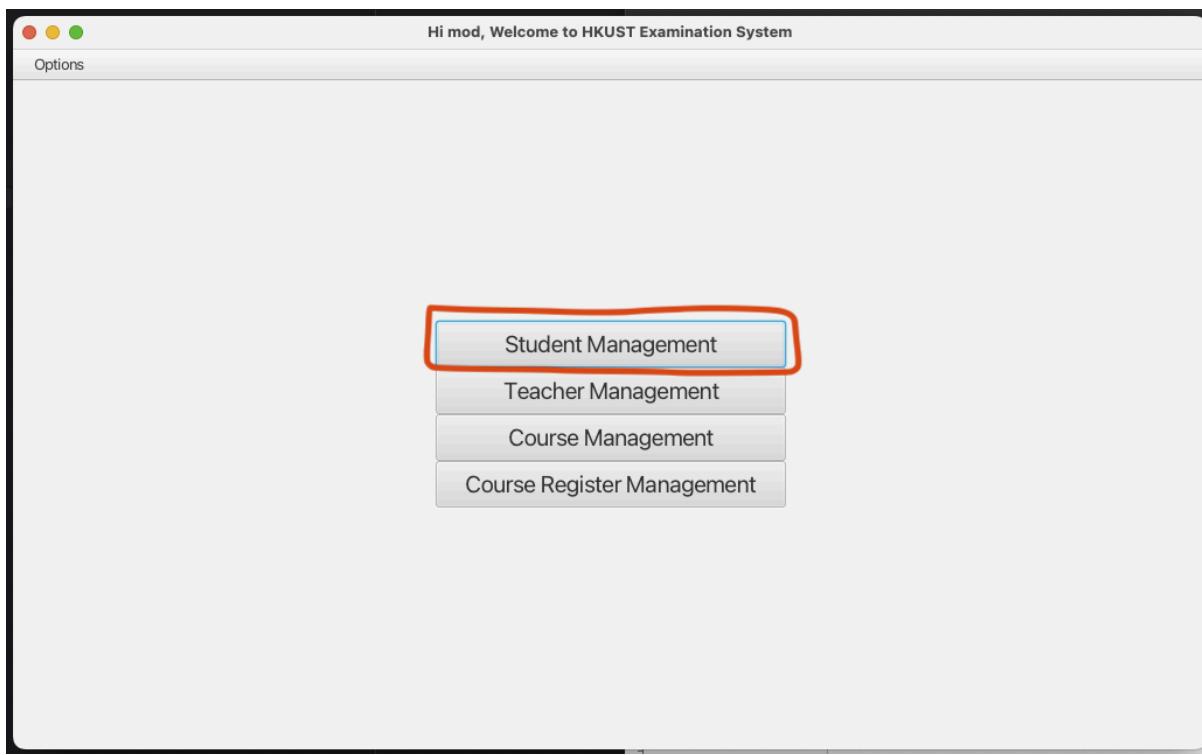
To **notify the user has successfully logged in to the manager system**
there will be a notification:



After the user pressed ok, it will change to the main UI for the manager:



TASK 3.3.1: Handling the student management by manager



For Student Management, press the Student Management button, and user will see this screen:

The screenshot shows a window titled "Student Management". At the top, there are three input fields: "Username:", "Name:", and "Department:". To the right of these are two buttons: "Reset" and "Filter". Below the input fields is a table with columns: Username, Name, Age, Gender, Department, and Password. The table contains four rows of data. On the right side of the window, there is a sidebar with labels and input fields for filtering: "Username:", "Name:", "Age:", "Gender:" (with a dropdown menu showing "Male"), "Department:", and "Password:". At the bottom of the window are four buttons: "Delete", "Refresh", "Add", and "Update".

Username	Name	Age	Gender	Department	Password
TomUsername	Tom Brown	23	Male	English	test123
LilyUsername	Lily Adams	20	Female	Physics	test123
AlexUsername	Alex Johnson	22	Male	Computer Science	test123
TestUsername1	TestName1	22	Non-Binary	Computer Science	test123

Filter & Reset:

This screenshot is similar to the previous one, showing the "Student Management" window. Three red arrows point downwards from the text "For filter, the user need to first fill in the username, name or department that you want to filter, then press the Filter button" to the "Username:", "Name:", and "Department:" input fields respectively. The "Filter" button is highlighted with a red circle.

For filter, the user need to first fill in the username, name or department that you want to filter, then press the Filter button

For User Friendliness, the user don't need to type exact values for filtering the students

For Example, i want to find the student TomUsername, i can just type tom in the username field

Filter		Search Results			
Username	Name	Age	Gender	Department	Password
TomUsername	Tom Brown	23	Male	English	test123
TomUsername2	Tommy	23	Female	Computer Science	test123

And now we see there are 2 toms, we can find the one we want by filling the remaining filters to search them or just find them on the table below, if i want to find the Tom that is in English Department we can do this:

Filter		Search Results			
Username	Name	Age	Gender	Department	Password
TomUsername	Tom Brown	23	Male	English	test123

If i want to reset the filter, just click the Reset button next to it.

Filter Algorithm for students:

For easier filter for users, the filter will filter things that contains(), so that user no need to input the exact thing for the fields that they want to filter

Filter:

First fetch the data of students to a list form the database, then apply filters on different fields if it is not empty, and remove the data if the student in the list does not contains what the user inputs, and the filter will IGNORE UPPER CASE OR LOWER CASE for easy filter for user.

And after removing all unused data, just set it to the observable list.

Add Students:

The user need to fill in the student data on the right panel:

Username:

Name:

Age:

Gender:

Male

Department:

Password:

Add

Update

If the user have **not fill all required fields** on the panel, this will pop out:



Make Sure the Username of the student is Unique

As an example:

Username:

Name:

Age:

Gender:

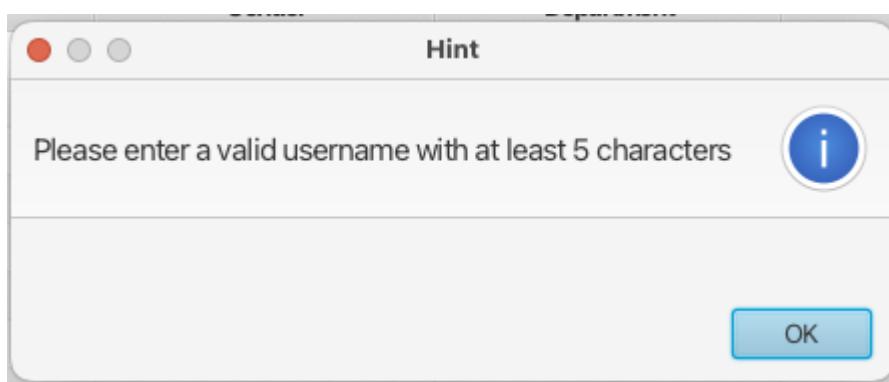
Department:

Password:

There **already exist another student** called TomUsername, this will pop out if you click the add button:



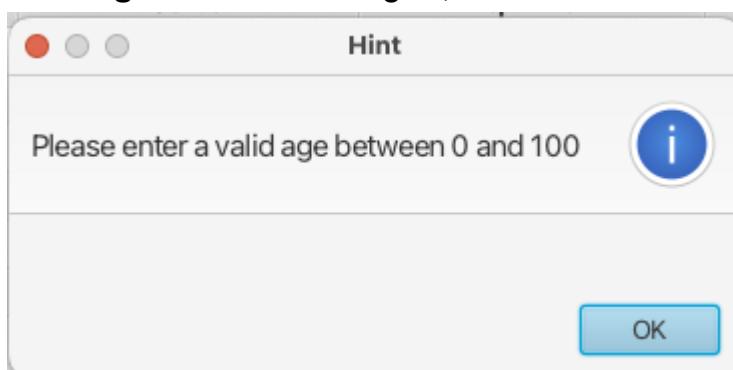
If the **username is < 5 characters**:



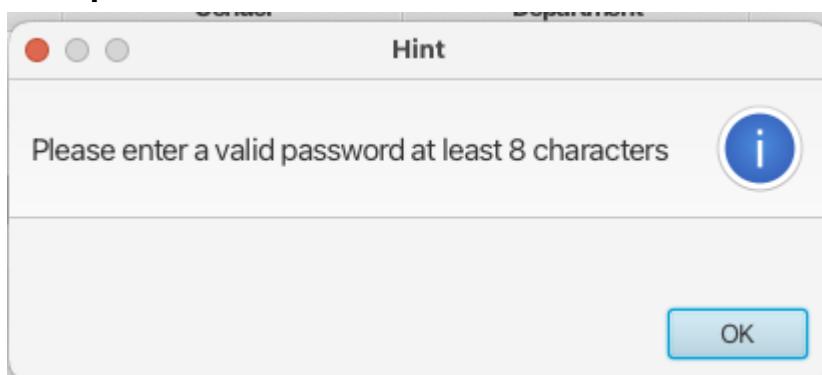
If the **age is not valid**, e.g **strings**:



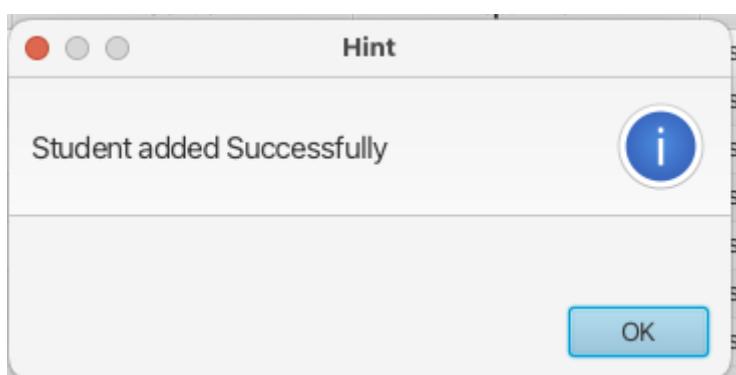
If the age is not valid e.g -1, 1000:



If the password has < 8 characters:



After the user successfully add the student, the system will **auto refresh the screen** (Refresh function details in below) and the user will be able see the student that has added, and there will be a **notification** for notifying the user the student is added:

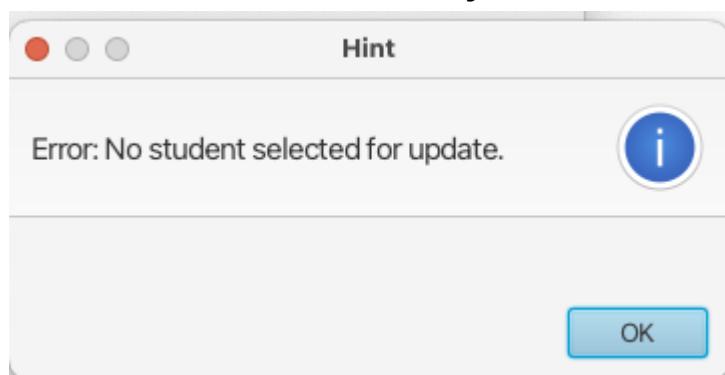


Update Student:

The user first need to select the student by clicking the table next to it:

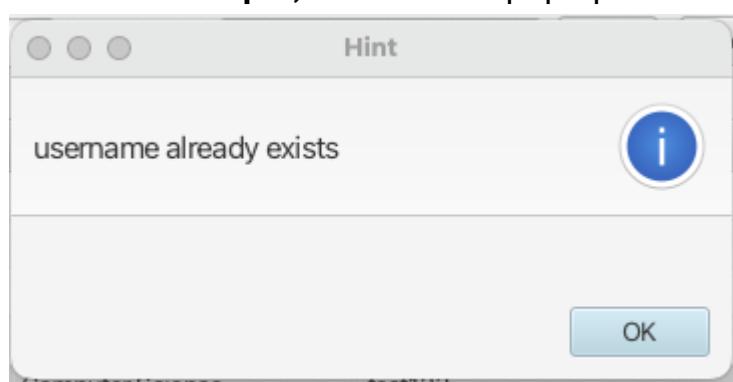
The screenshot shows a 'Student Management' application window. At the top, there are search fields for 'Username', 'Name', 'Department', and buttons for 'Reset' and 'Filter'. Below is a table with columns: Username, Name, Age, Gender, Department, and Password. The table contains several rows of student data. A specific row for 'Tommy' (Username: TomUsername2, Name: Tommy, Age: 23, Gender: Female, Department: Computer Science, Password: test123) is highlighted with a blue selection bar. To the right of the table, a detailed view panel displays the selected student's information: Username: TomUsername2, Name: Tommy, Age: 23, Gender: Female, Department: Computer Science, and Password: test123. At the bottom of the window are buttons for 'Delete', 'Refresh', 'Add', and 'Update'.

If the user have not select any student and click Update, this will pop up:

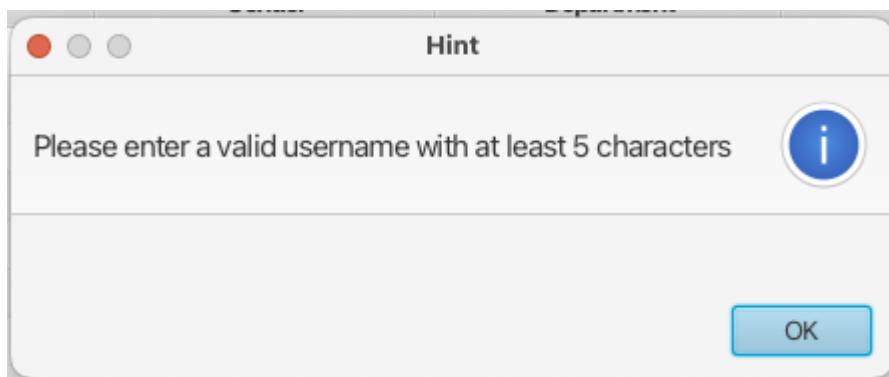


After the user select a student, his/her information will show up on the right panel,

The user can modify it if he want, Make sure the username you modified should be unique, else this will pop up:



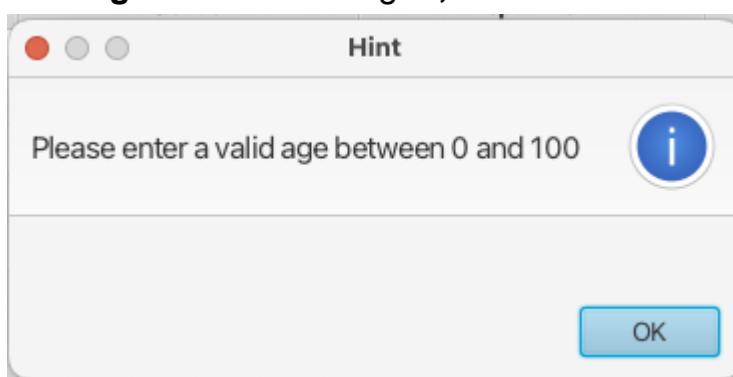
If the **username** is < 5 characters:



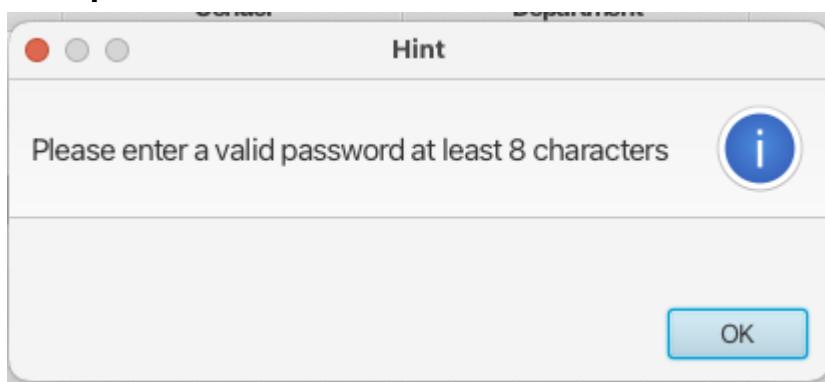
If the **age** is not valid, e.g. strings:



If the **age** is not valid e.g -1, 1000:



If the **password** has < 8 characters:



After a **successful update**, the table will be refreshed and the user can see there will be a notification:

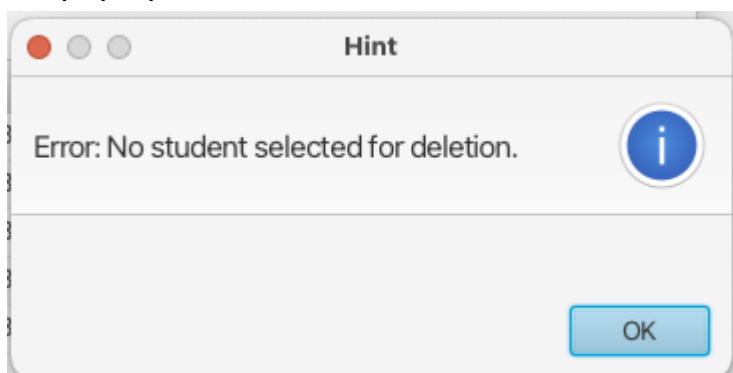


And the user can **see the changes immediately**.

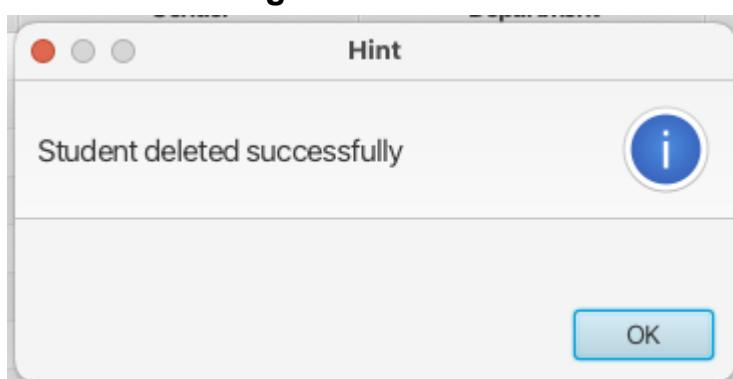
Student Deletion:

First the user needs to **select a student from the table** and **click the delete button** to delete the student.

If there are **no selected student** and the user pressed the delete button, this will pop up:

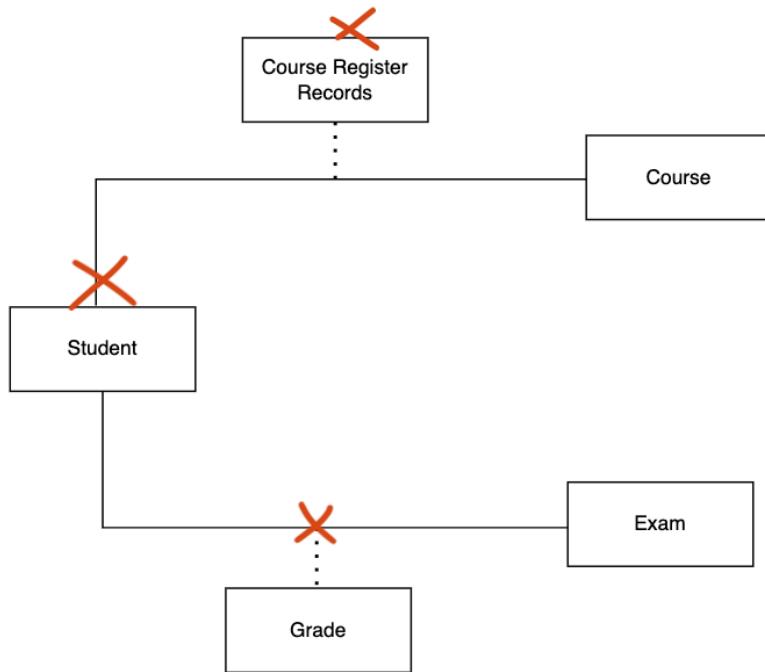


There will be a **notification if the student is deleted successfully**, and **immediate change will be seen** on the table



Details for the deletion of students:

If a student is deleted, it will also **erase all related grades** of the deleted student, and **all related course registration records** of the deleted student will be erased.



Delete student Algorithms:

First check if the selected student is null, if not then continue.

I first fetch all students data, grade data, and Course registration data out, then Loop through grade, find if have any selected student grade, if yes then delete that data

Then Loop through Course record, and find any registered course record for that student, if yes then delete the record.

At last, delete the selected student.

Refresh Screen:

Refresh button will ONLY update the table, but not the filters,

As a example

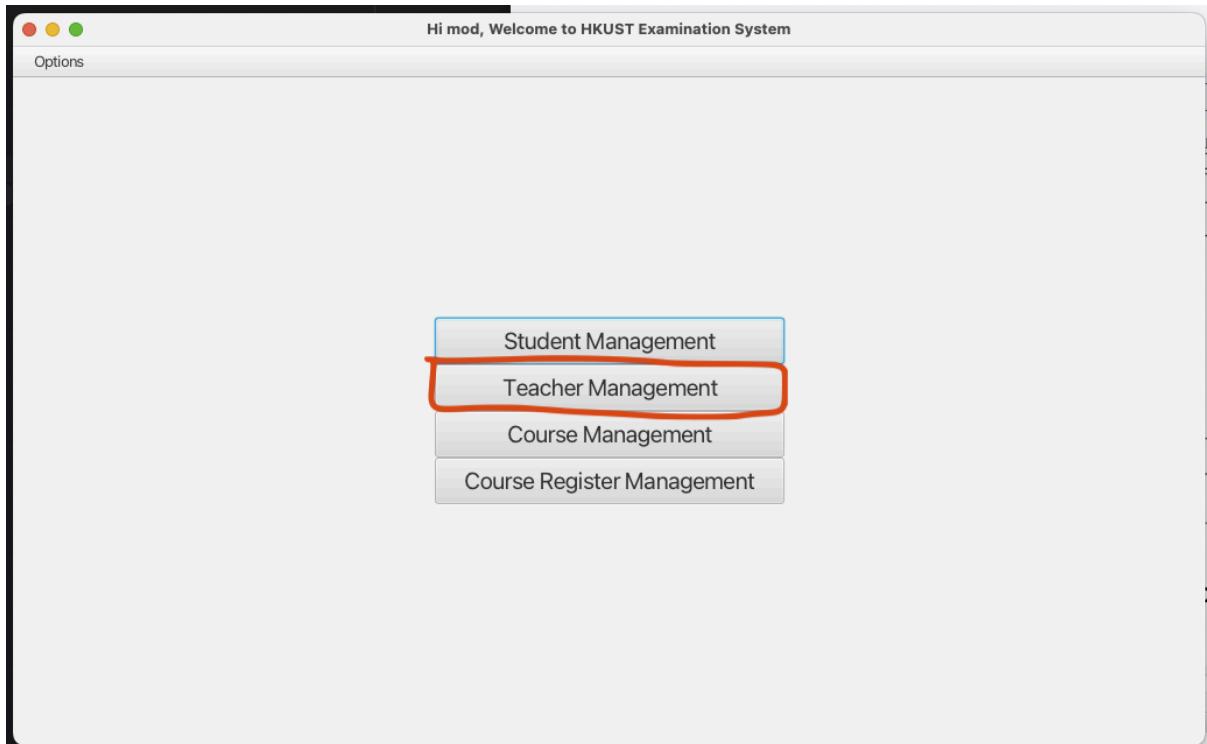
If i filter Tom

Search Results					
Username	Name	Age	Gender	Department	Password
TomUsername	Tom Brown	23	Male	English	test123

And I keep the filter on, and I add one more student called Test, Test will not appear in the table, as the filter is on, So the user needs to click reset for resetting the filter and the user will see student Test on the table.

This is for when there is lots of data inside the database, and if everytime refreshes the filter is resetted, it will be non-user friendly.

TASK 3.3.2: Handling the Teacher Management by Manager



Press Teacher Management page by clicking the button Teacher Management, and the main screen will show up:

A screenshot of the "Teacher Management" page. At the top, there are search fields for "Username", "Name", "Department", and buttons for "Reset" and "Filter". Below is a table listing teacher information:

Username	Name	Gender	Age	Position	Department	Password
teacher1	Dr. Smith	Female	48	Professor	Computer Science	teach123
teacher2	Mr. Green	Male	52	Teaching Assistant	Mathematics	teach123
teacher3	Dr. White	Male	57	Professor	English	teach123
teacher4	Ms. Black	Female	42	Teaching Assistant	Physics	teach123
teacher5	Mr. Blue	Male	36	Lecturer	Computer Science	teach123
test	test	Male	12	Lecturer	test	test

To the right of the table, there is a sidebar with filter input fields:

- Username:
- Name:
- Gender: Male
- Age:
- Position: Professor
- Department:
- Password:

At the bottom right are buttons for "Delete", "Refresh", "Add", and "Update".

Filter & Reset Filter:

Same as the filter and reset function as Student Management.

The user first need to input the Username, Name or Department of the teacher user wants to find, and press the Filter button to filter the unwanted teachers on the tables:

Username	Name	Gender	Age	Position	Department	Password
teacher1	Dr. Smith	Female	48	Professor	Computer Science	teach123
teacher2	Mr. Green	Male	52	Teaching Assistant	Mathematics	teach123
teacher3	Dr. White	Male	57	Professor	English	teach123
teacher4	Ms. Black	Female	42	Teaching Assistant	Physics	teach123
teacher5	Mr. Blue	Male	36	Lecturer	Computer Science	teach123
test	test	Male	12	Lecturer	test	test

Username:
 Name:
 Department:

Username:
 Name:
 Gender: Male
 Age:
 Position: Professor
 Department:
 Password:

Delete Refresh Add Update

For User Friendliness, the user don't need to type exact values for filtering the teachers

For example, if user want to find teacher1, the user only need to type “1” in the Username text box and press the filter button

If the user wants to reset the filters, Click the Reset button next to it to reset the filters and the screen will auto refresh to update the tables.

Filter Teacher Algorithm:

For easier filter for users, the filter will filter things that contains(), so that user no need to input the exact thing for the fields that they want to filter

Filter:

First fetch the data of teacher to a list form the database, then apply filters on different fields if it is not empty, and remove the data if the teacher in the list does not contains what the user inputs, and the filter will IGNORE UPPER CASE OR LOWER CASE for easy filter for user.

And after removing all unused data, just set it to the observable list.

Add Teachers:

You need to first fill in the data for the teacher in the right panel:

Username:

Name:

Age:

Gender:

Male

Department:

Password:

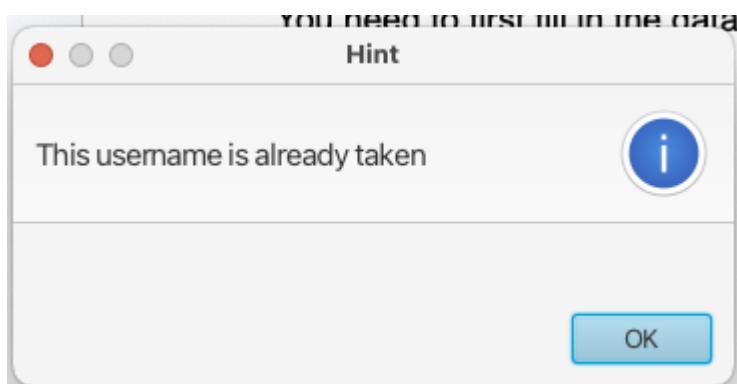
Add

Update

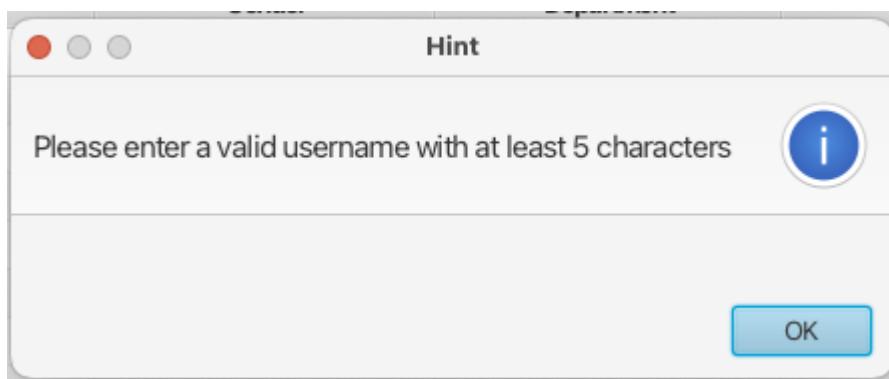
If the user have not filled all required fields and press the Add button, this will pop up:



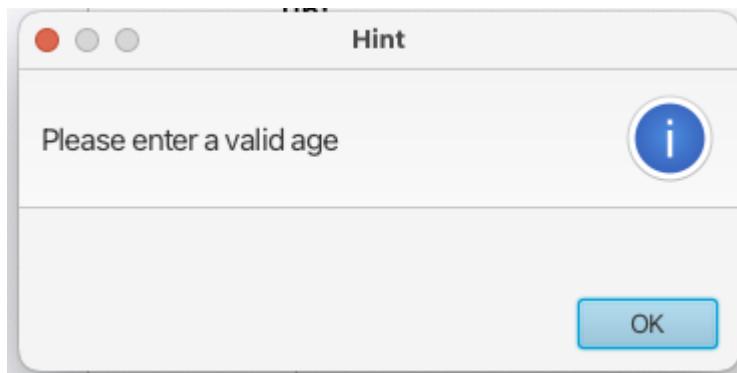
Make sure the **Username you filled in is unique**, or else this will pop up:



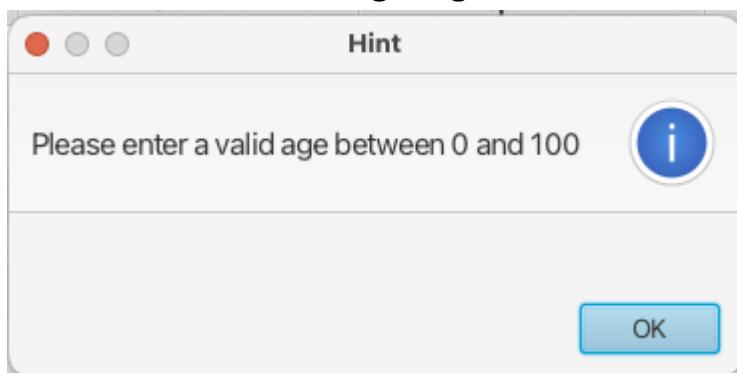
If the **username** has < 5 characters:



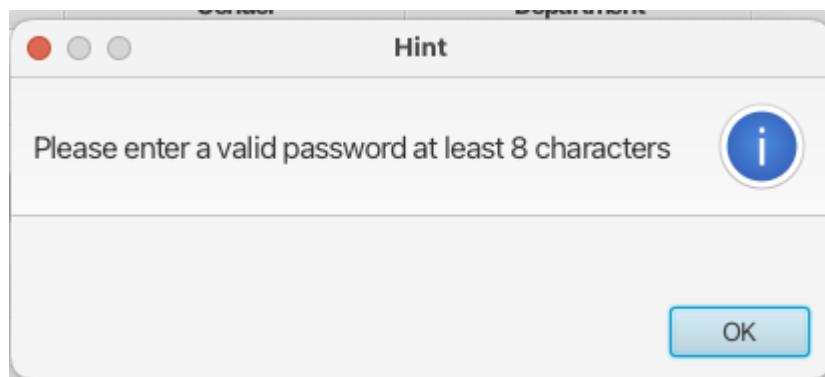
Make sure you filled in a valid age, if you fill in **invalid age e.g strings**:



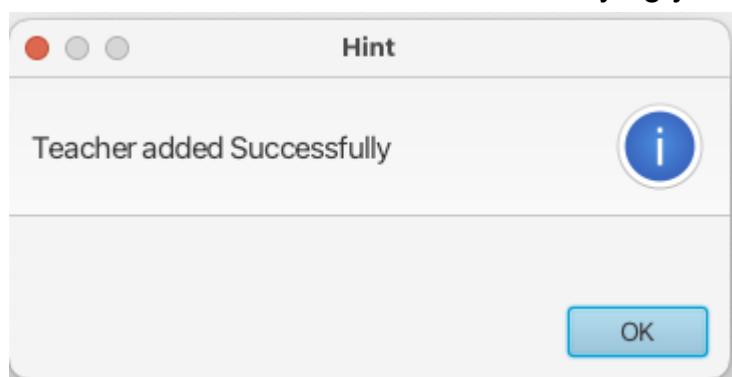
If there are non valid age, eg. -1,1000:



If the **password** has < 8 characters:



If you added the teacher successfully, there will be a immediate update for the table and there will be a notice for notifying you the teacher is added:

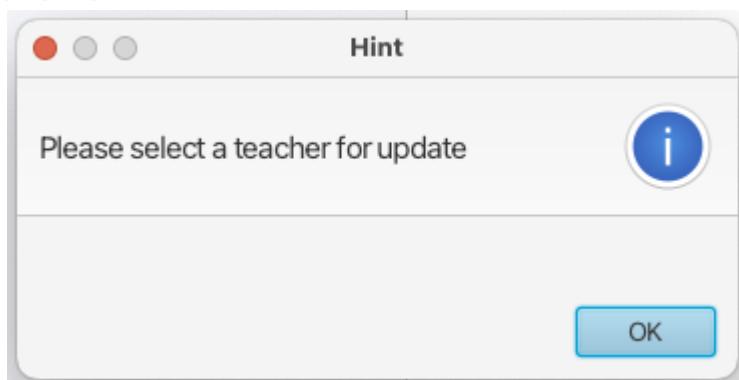


Update Teachers:

To update teachers, you first need to select a teacher to update from the table,

The screenshot shows a 'Teacher Management' application window. At the top, there are search fields for 'Username', 'Name', 'Department', and buttons for 'Reset' and 'Filter'. Below is a table with columns: Username, Name, Gender, Age, Position, Department, and Password. The table contains several rows of teacher data. On the right side, there is a panel for selecting a teacher, which includes fields for 'Username' (set to 'test'), 'Name' (set to 'test'), 'Gender' (set to 'Male'), 'Age' (set to '12'), 'Position' (set to 'Lecturer'), 'Department' (set to 'test'), and 'Password' (set to 'test'). At the bottom of the right panel are buttons for 'Delete', 'Refresh', 'Add', and 'Update'.

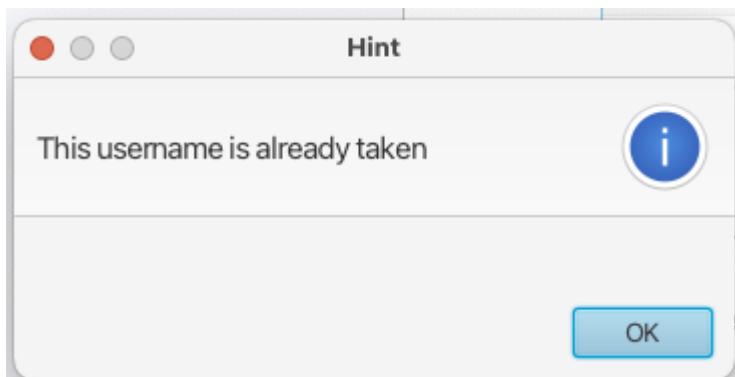
And it will show the data of the teacher you selected on the right panel.
If the user did not select any teachers and press the Update button, this will pop up:



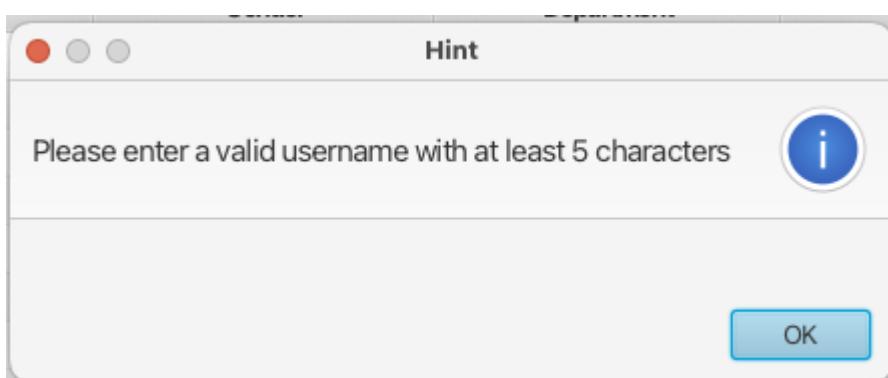
Make Sure when the user are modifying the teacher, please **fill in all fields requires**, or else:



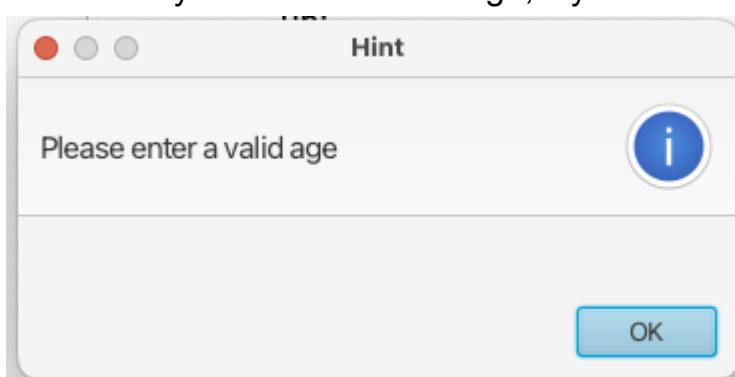
Make sure the **username modified** is unique, or it will show:



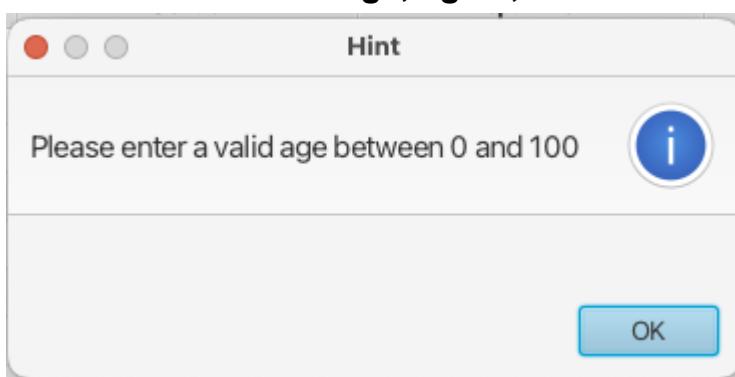
If the **username has < 5 words**:



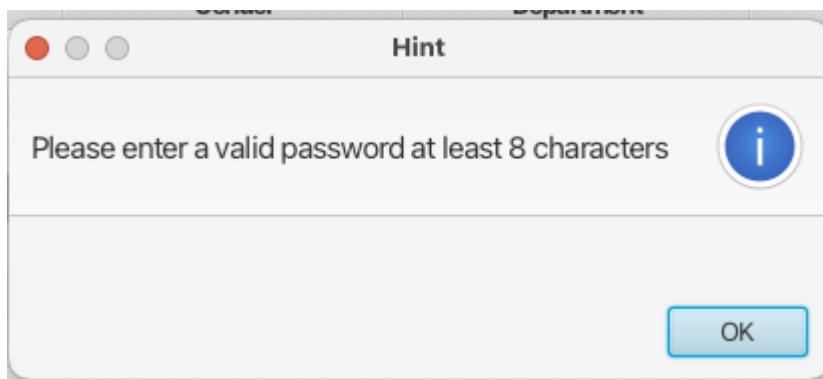
Make sure you filled in a valid age, if you fill in **invalid age e.g strings**:



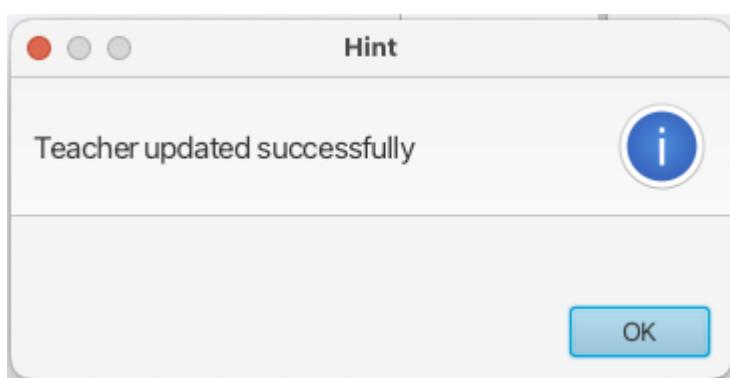
If there are **non valid age**, eg. -1,1000



If the **password has < 8 characters**:



If the user has successfully update the data of the teacher, immediate change will be shown on the table and there will have a notification:



Teacher Deletion:

To delete a teacher, you need to first select a teacher to delete from the table:

A screenshot of a "Teacher Management" application window. At the top, there are search fields for "Username", "Name", "Department", a "Reset" button, and a "Filter" button. Below is a table with columns: Username, Name, Gender, Age, Position, Department, and Password. The table contains the following data:

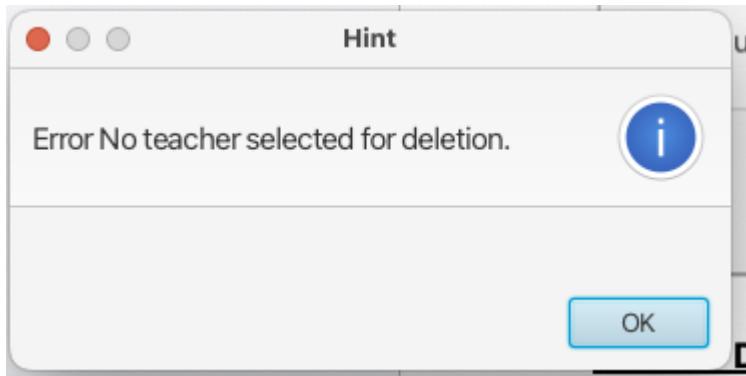
Username	Name	Gender	Age	Position	Department	Password
teacher1	Dr. Smith	Female	48	Professor	Computer Science	teach123
teacher2	Mr. Green	Male	52	Teaching Assistant	Mathematics	teach123
teacher3	Dr. White	Male	57	Professor	English	teach123
teacher4	Ms. Black	Female	42	Teaching Assistant	Physics	teach123
teacher5	Mr. Blue	Male	36	Lecturer	Computer Science	teach123
test	test	Male	12	Lecturer	test	test
teacher13	teach	Male	12	Professor	Computer Science	test123

On the right side, there is a sidebar with form fields corresponding to the table columns:

- Username: teacher13
- Name: teach
- Gender: Male
- Age: 12
- Position: Professor
- Department: Computer Science
- Password: test123

At the bottom are buttons for "Delete", "Refresh", "Add", and "Update".

If the user did not select a teacher for deletion and pressed the Delete button, a notice will show:



If the user has successfully delete a teacher, a notice will show:



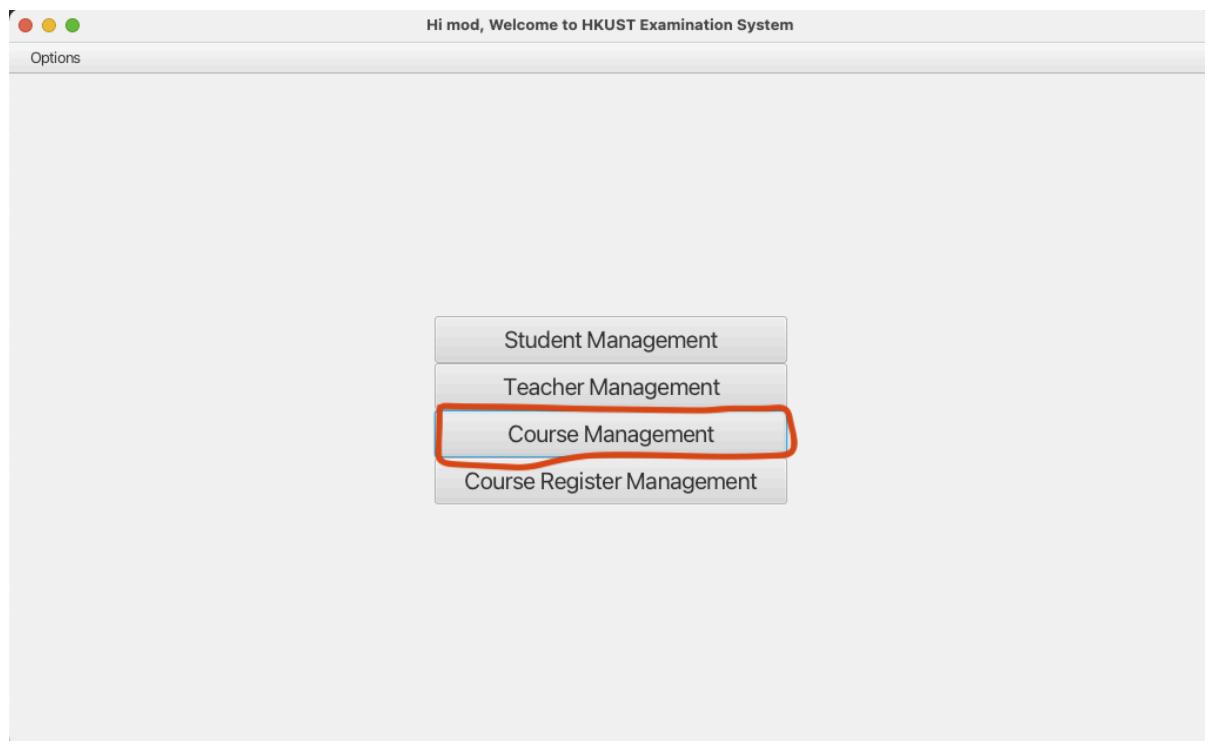
Details of deleting a teacher:

Since a teacher does not have relationships for other entities in the database, when a teacher is deleted, only his/her data will be deleted from the database.

Refresh Screen:

The refresh button acts same as the student management system, the refresh button will ONLY refresh the table data, but not the table, as for considerations of if there are a lot of data inside the table, it will be user not friendly if the refresh button refreshes the filter, so users need to re input the filter after refreshing the screen.

TASK 3.3.3: Handling the Course Management by Manager



Entering the Course Management system by pressing the Course Management button, and the Course Management screen will show up:

The screenshot shows the "Course Management" screen. At the top, there are three input fields: "Course ID:", "Course Name:", and "Department:". Below these are "Reset" and "Filter" buttons. The main area is a table with columns "Course ID", "Course Name", and "Department". The table contains the following data:

Course ID	Course Name	Department
MATH202	Linear Algebra	Mathematics
COMP3111	Software Engineering	Computer Science
COMP202	Data Structures	Computer Science
PHYS101	Physics I	Physics
CHEM101	General Chemistry	Chemistry
ENG202	Technical Writing	English
BIO101	Introduction to Biology	Biology
STAT101	Statistics	Mathematics
TestCourse	test	test

On the right side of the table, there are three input fields: "Course ID", "Course Name", and "Department", each with a corresponding "Reset" button. At the bottom of the screen are four buttons: "Delete", "Refresh", "Add", and "Modify".

Filter & Reset Filters:

To filter Courses, users need to input the CourseID, Course Name and Department to filter out unwanted courses on the table, and after they have inputted the filters in the text box, press the filter button

For User Friendliness, the user don't need to type exact values for filtering the Courses

The screenshot shows a 'Course Management' application window with two panels. The left panel displays a table of course data with columns: Course ID, Course Name, and Department. The right panel is a sidebar for filtering, containing input fields for Course ID, Course Name, and Department, along with a 'Filter' button. Red arrows point from the text 'For User Friendliness, the user don't need to type exact values for filtering the Courses' to the input fields and the 'Filter' button. In the first state (top), all three input fields are empty. In the second state (bottom), the 'Course ID' field contains the value 'MATH', demonstrating fuzzy filtering.

Course ID	Course Name	Department
MATH202	Linear Algebra	Mathematics
COMP3111	Software Engineering	Computer Science
COMP202	Data Structures	Computer Science
PHYS101	Physics I	Physics
CHEM101	General Chemistry	Chemistry
ENG202	Technical Writing	English
BIO101	Introduction to Biology	Biology
STAT101	Statistics	Mathematics
TestCourse	test	test

Course ID	Course Name	Department
MATH202	Linear Algebra	Mathematics

To reset the filters, just press the Reset Button next to Filter, it will clear the filters and update the tables

Filter Course Algorithms:

Filter:

First fetch the data of courses to a list form the database, then apply filters on different fields if it is not empty using the queryFuzzyByField

Add Courses:

To Add course, users first need to fill in the panel on the right:

Course ID

Course Name

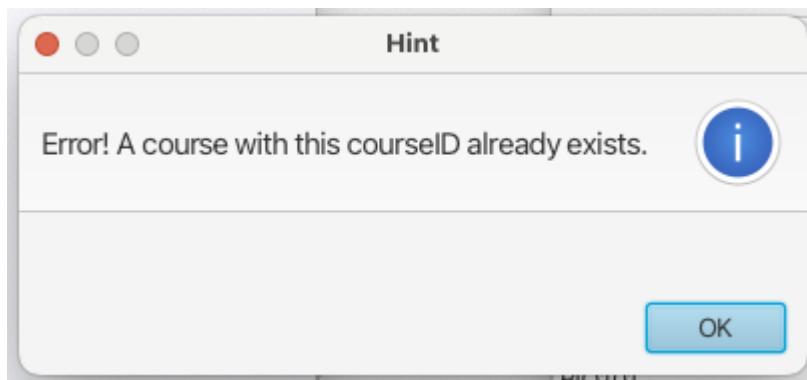
Department:

Add Modify

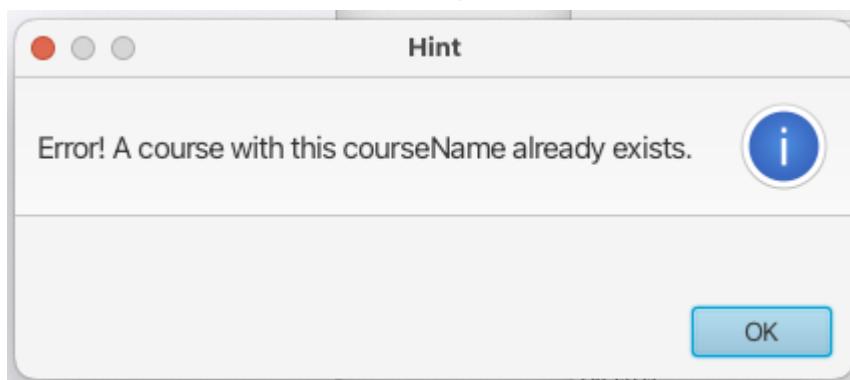
To make sure the user filled in all required fields. If there are missing fields and the user pressed the Add button, a notice will show up:



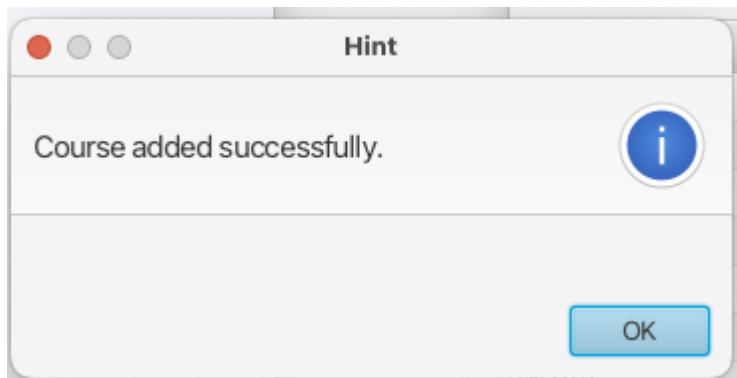
To make sure the users has filled in unique CourseID, If the course ID are used, a notice will show up:



To make sure the users has filled in unique CourseName, If the Course Name are used, a notice will show up:



If the user has successfully added a course, a notice will show up:



And after the course is added, the table will immediately refresh and show the changes made.

Modify Courses:

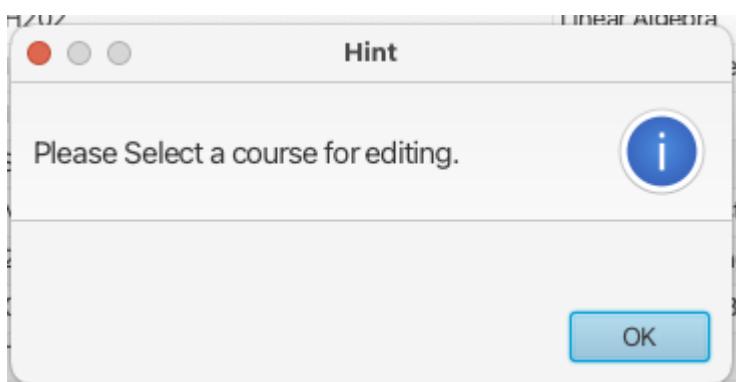
To Modify courses, users first need to select a course from the table:

The screenshot shows a window titled "Course Management". At the top, there are search fields for "Course ID", "Course Name", and "Department", along with "Reset" and "Filter" buttons. Below is a table with columns "Course ID", "Course Name", and "Department". The table contains the following data:

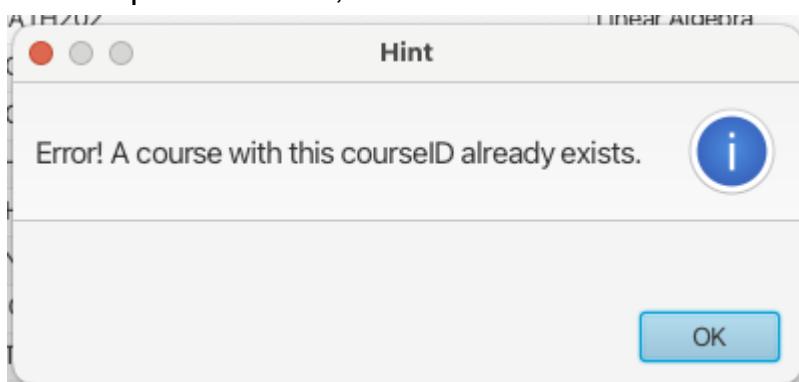
Course ID	Course Name	Department
MATH202	Linear Algebra	Mathematics
COMP3111	Software Engineering	Computer Science
COMP202	Data Structures	Computer Science
PHYS101	Physics I	Physics
CHEM101	General Chemistry	Chemistry
ENG202	Technical Writing	English
BIO101	Introduction to Biology	Biology
STAT101	Statistics	Mathematics
TestCourse	test	test
TestCourse2	test2	test

A sidebar on the right shows input fields for "Course ID" (TestCourse2), "Course Name" (test2), and "Department" (test). At the bottom are buttons for "Delete", "Refresh", "Add", and "Modify".

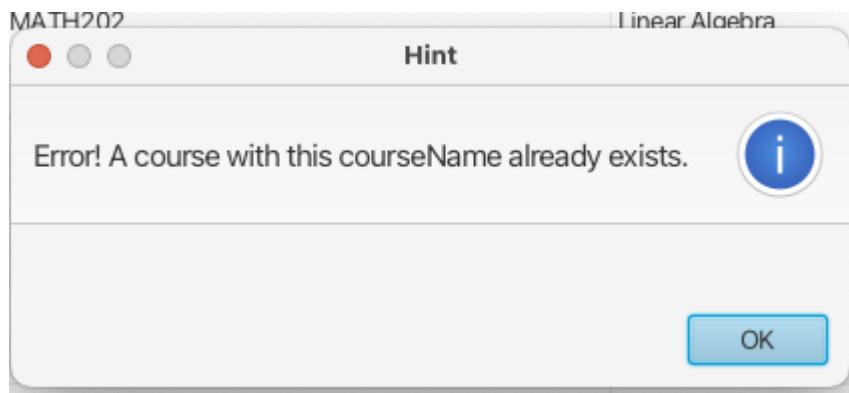
If the user have not select the course and press the Modify button, a notice will show:



To make sure the user has inputted a unique CourseID, if the user inputted a non-unique course ID, a notice will show:



To make sure the user has inputted a unique Course Name, if the user inputted a non-unique Course Name, a notice will show:

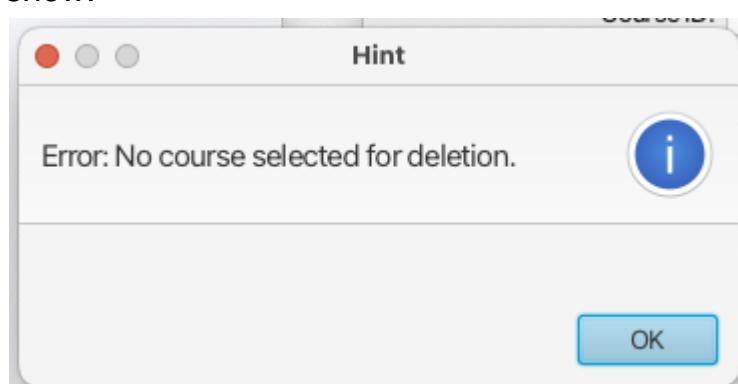


Deletion of Courses:

To delete a course, the user need to first select the course form the table:

Course ID	Course Name	Department
MATH202	Linear Algebra	Mathematics
COMP3111	Software Engineering	Computer Science
COMP202	Data Structures	Computer Science
PHYS101	Physics I	Physics
CHEM101	General Chemistry	Chemistry
ENG202	Technical Writing	English
BIO101	Introduction to Biology	Biology
STAT101	Statistics	Mathematics
TestCourse	test	test
TestCourse2	test2	test

If the user did not select a course and press the Delete Button, a notice will show:

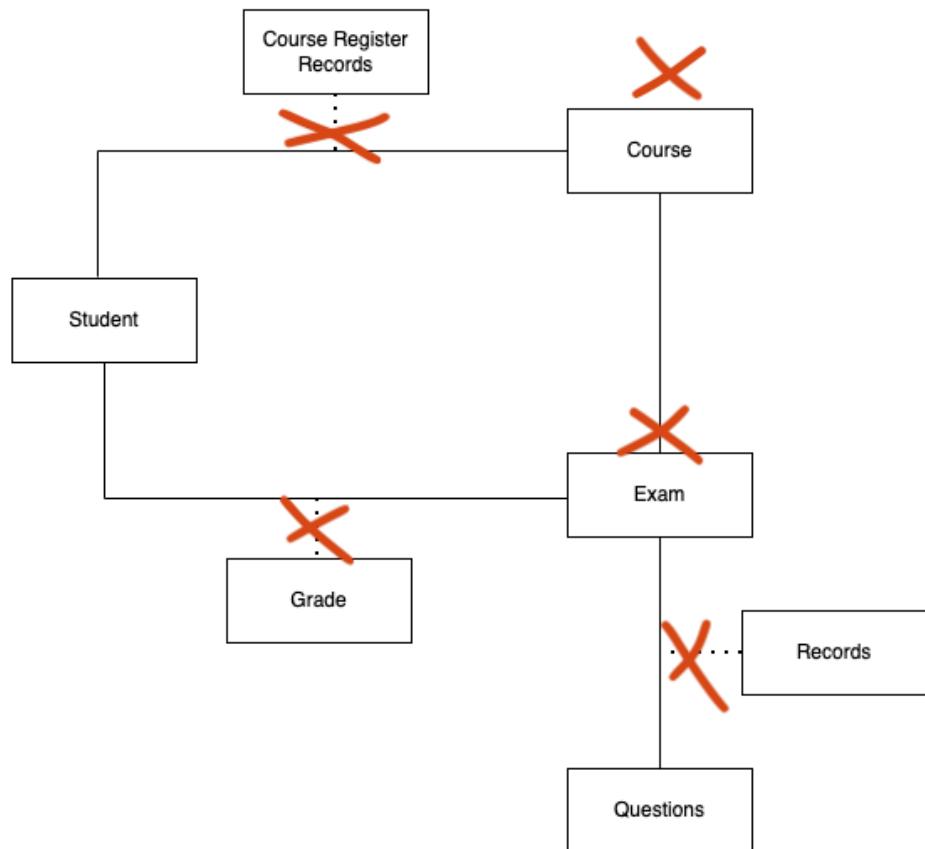


If the deletion is successful for deleting the selected course, a notice will show:



The table will immediately refresh and update the changes from the database.

Details of deletion of courses:



To make sure there is no corruption for the data, if the manager deletes a course, the related course registration record with the course will also be deleted, the related exam of the course will be deleted, so that the grades and the linkage for Exam and Questions will also be deleted.

Delete Course Algorithms:

Since there are a lot of things that are related to course, so the algorithm will be a bit complicated.

First check if the selected course is null, if not then continue.

Fetch all data out, course, course registration records, exam, grade, records, fetch them to different list.

Loop all grades, if the grade's related to the selected course -> delete data

Loop all exams, if the exam is related. Loop all records and delete all related question-exam records, then delete the related exam.

Loop all course records, if the record is related to the course, delete the record.

At last delete the course.

Refresh Screen:

The refresh button acts same as the student management system, the refresh button will ONLY refresh the table data, but not the table, as for considerations of if there are a lot of data inside the table, it will be user not friendly if the refresh button refreshes the filter, so users need to re input the filter after refreshing the screen.

EXTRA: Course Register Management System

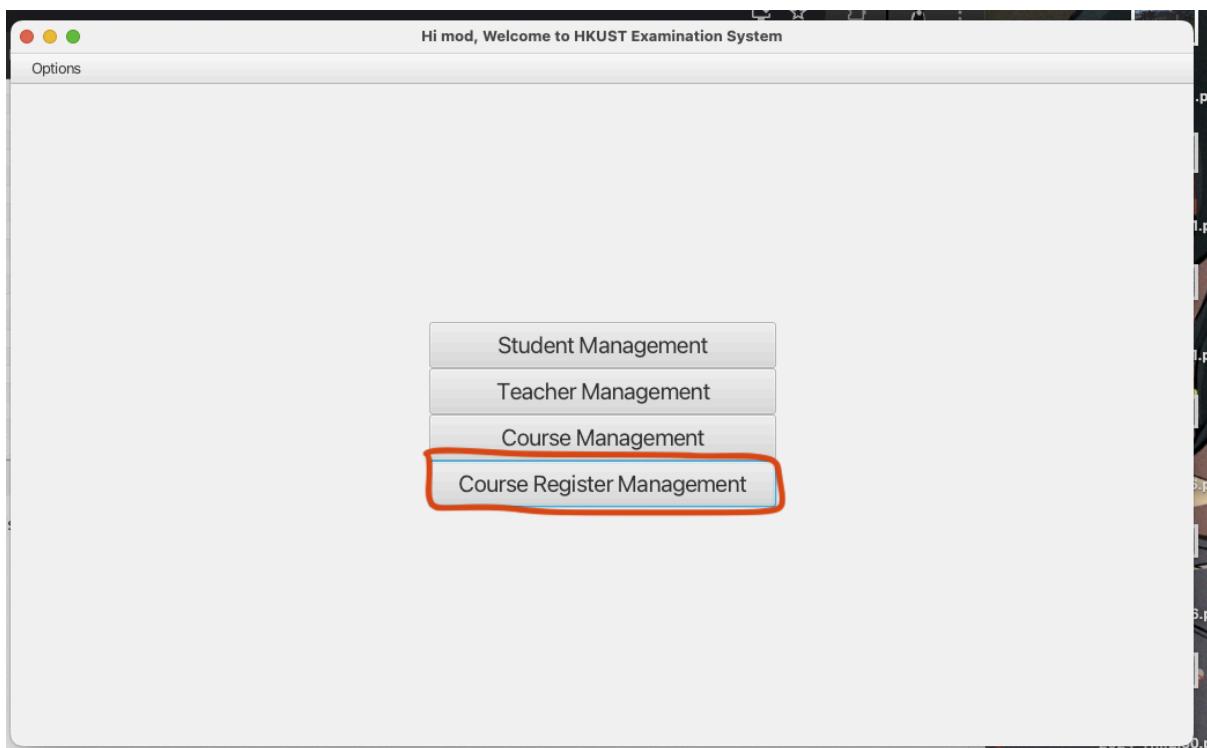
This additional system is made for students that can control what exams that they can take.

In task 1: it is required that for each student they can choose only the Exams that they can attend.

We assume Students can only attend the Exam that is in the course that the student has registered.

There will also be a course register UI for task 1 for students to register their courses (They can't drop courses there), and for the manager, this system can help students to add and drop courses.

To access the system users can press the course register management button:



After they press the course register management Button, this screen will show up:

A screenshot of a "Course Registration" screen. At the top, there are search fields for "Username" and "Course", followed by "Reset" and "Filter" buttons. Below is a table with two columns: "Username" and "CourseRegistered". The table data is as follows:

Username	CourseRegistered
AlexUsername	COMP3111
TomUsername	COMP202
LilyUsername	PHYS101
AlexUsername	ENG202
TomUsername	BIO101
LilyUsername	STAT101

On the right side of the table, there are two dropdown menus labeled "Username:" and "Course". At the bottom of the screen are three buttons: "Delete", "Refresh", and "Add".

In this system, users can ONLY do these actions:

- Filter
- Reset Filter
- Delete Courses
- Add Courses
- Refresh screens

Notes: for why we have no options for modifying the course register records, we think the actions we can do is add and drop courses, but there are no update or modify add drop records. So if the user want to change the course from COMP3111 to COMP3511, they need to first drop COMP3111 then add COMP3511 or first add COMP3511 then drop COMP3111.

Filter Course Register Records:

To filter course register records, user can first input the filters for Username of the Student or Courses ID for filtering the course registration records and press the Filter Button

For User Friendliness, the user don't need to type exact values for filtering the students

The screenshot shows a Java Swing application window titled "Course Registration". At the top, there are two text input fields labeled "Username:" and "Course", each with a red arrow pointing to it. To the right of these fields are two buttons: "Reset" and "Filter", with a red box highlighting the "Filter" button. Below the input fields is a table with columns "Username" and "CourseRegistered". The table contains the following data:

Username	CourseRegistered
AlexUsername	COMP3111
TomUsername	COMP202
LilyUsername	PHYS101
AlexUsername	ENG202
TomUsername	BIO101
LilyUsername	STAT101

At the bottom of the window are three buttons: "Delete", "Refresh", and "Add".

Below this window is a second screenshot showing the same interface after a filter has been applied. The "Username:" field now contains "ale". The table now only displays rows where the "Username" column contains "ale":

Username	CourseRegistered
AlexUsername	COMP3111
AlexUsername	ENG202

If the user wants to reset the filters, just press the Reset button to reset all filters applied, the table will auto refresh.

Filter Course Registration records Algorithms:

For easier filter for users, the filter will filter things that contains(), so that user no need to input the exact thing for the fields that they want to filter

Filter:

First fetch the data of course registration record to a list from the database, then apply filters on different fields if it is not empty, and remove the data if the course registration record in the list does not contain what the user inputs, and the filter will IGNORE UPPER CASE OR LOWER CASE for easy filter for user.

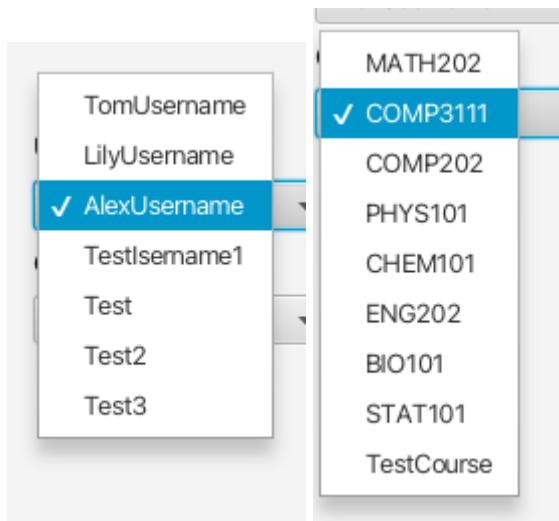
And after removing all unused data, just set it to the observable list.

Register Courses:

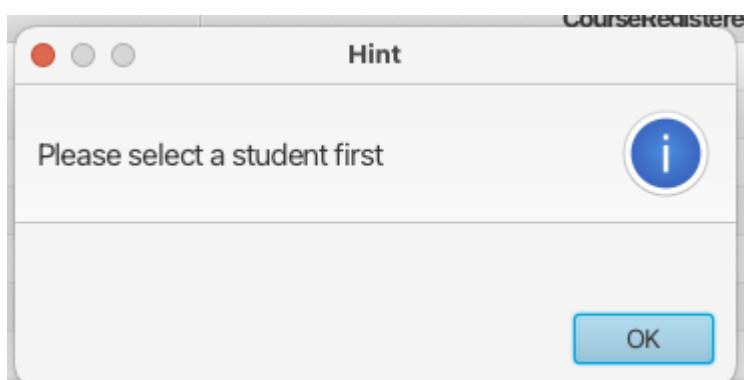
To help the student to register courses, the manager can use the right panel to choose who is going to register which courses:

The image shows a user interface for registering courses. It consists of a light gray rectangular box containing two dropdown menus. The first dropdown menu is labeled "Username:" and the second is labeled "Course". Both dropdown menus are currently empty. At the bottom left of the box is a small, rectangular button with the word "Add" centered on it.

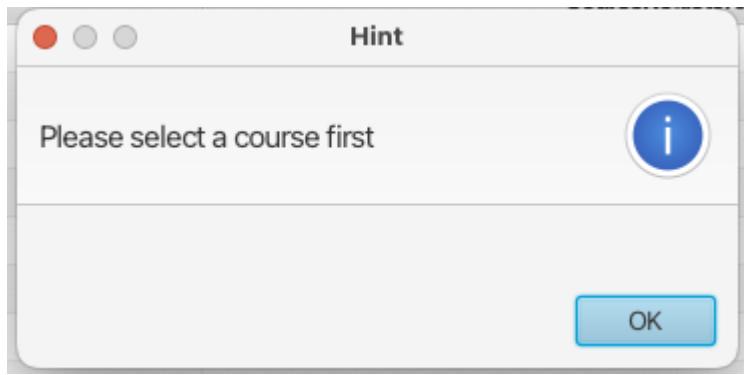
The two choice box will contain all options for students and courses:



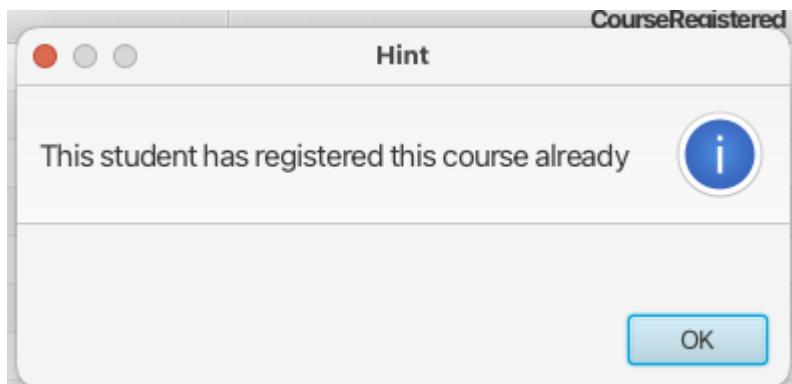
To make sure the user will input all fields, if the Username Field is missing, a notice will show:



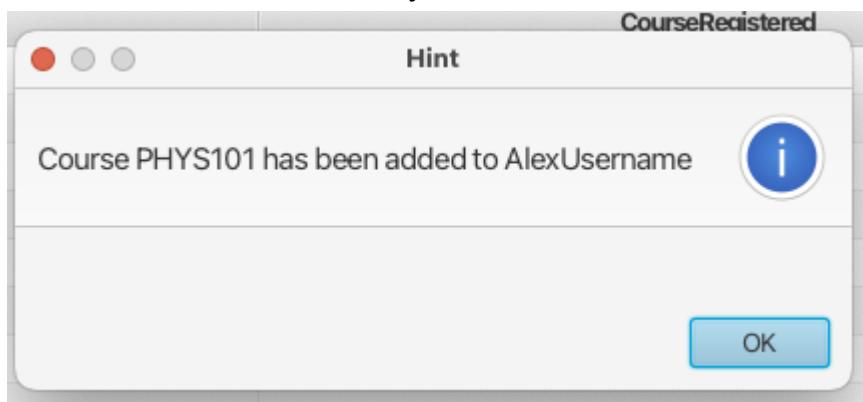
If the Course field is missing, a notice will show:



If the course has been registered by the student selected, a notice will show:



If the course is successfully added to the student, a notice will show:



Drop Course:

The action of dropping courses can ONLY be done for the manager.

To help the student to drop a course, the user must first select the course registration record from the table to delete:

Course Registration

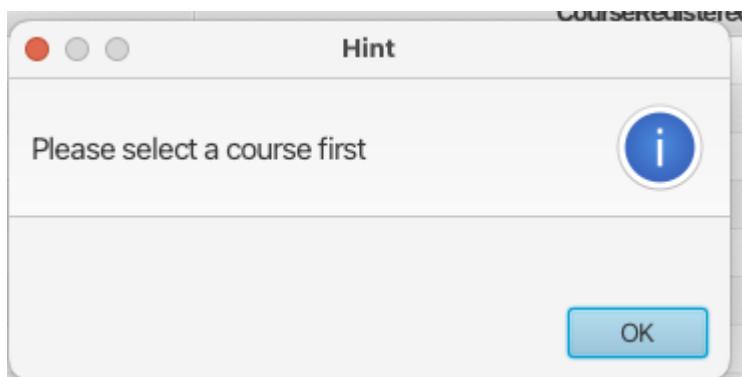
Username	CourseRegistered
AlexUsername	COMP3111
TomUsername	COMP202
LilyUsername	PHYS101
AlexUsername	ENG202
TomUsername	BIO101
LilyUsername	STAT101
AlexUsername	PHYS101

Username: Course: Reset Filter

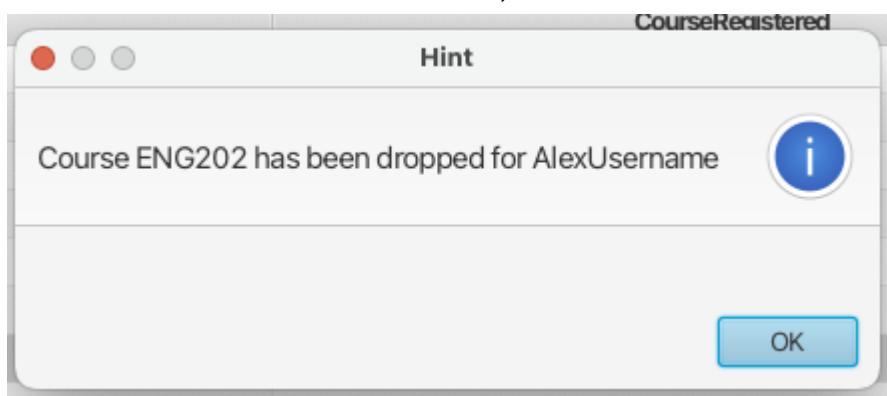
Username: Course:

Delete Refresh Add

If the user did not choose any course registration records and presses the Delete button, a notice will show:



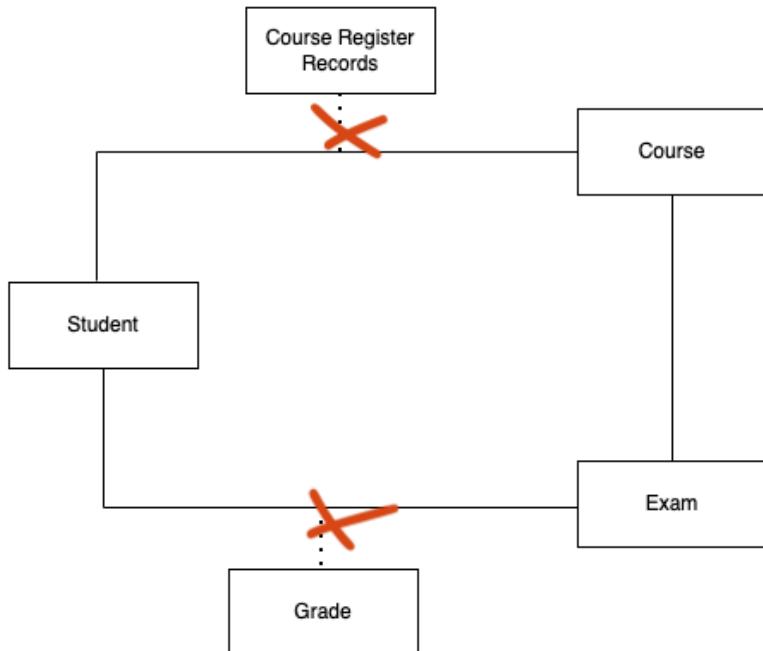
When the deletion is successful , a notice will show:



Details of Deletion of Course Registration Records:

To delete the course registration records, we need to also delete all its related entities to ensure there is no corruption for the database.

Despite that there is no data that is related to the course registration records, we have assumed that the student can ONLY attend the Course Exams in the course that the student has registered. Therefore, if we drop a course for the student , if there are records for the exam in this course for this student, we also need to erase the grade of it:



Delete Course Register Records Algorithms:

First check if the record is null, if not then continue.

First fetch all related data, course register records and grades.

Loop grades, delete those grades that have the same course key and same student key as in the course register records.

Then delete the course register record data.

Refresh Screen:

The refresh button acts same as the student management system, the refresh button will ONLY refresh the table data, but not the table, as for considerations of if there are a lot of data inside the table, it will be user not friendly if the refresh button refreshes the filter, so users need to re input the filter after refreshing the screen.