

Task 2 by Cheung Tuen King (SID: 20983959)

Supplementary Note

Assumption in Task 2 Implementation

1. Deleting Course ID would cause deletion of affected Exam
2. Deleting Question would cause deletion of affected Exam containing only the question for deleting
3. Any modification on existing question and exam would not apply to the submission of student
4. Every exam should have their name unique in a course (i.e. course ID + exam name should be unique for exam)
5. No 2 questions have all attributes same

Extended Feature:

1. Teachers have the following limitations while setting password during registration

Password should contain:

1. At least 1 special character from "!@#\$%^&*_+<>/-"
2. At least 1 number from 0 to 9
3. At least 1 small letter from a to z
4. At least 1 capital letter from A to Z
5. No blank space

2. In both exam and question management UI, selecting any record in the table would have their information automatically filled in in the input form for convenient updating
3. In exam management UI, teacher can add or delete all questions while creating or updating exam

Sample Input and Output

Teacher Registration

Normal registration form input: Input the sample attributes and click “Register”

Sample input:

- Username: teacher1
- Name: Teacher A
- Gender: Male
- Age: 33
- Position: Instructor
- Department: COMP
- Password/ Confirmed Password: 123Abc!@#

The screenshot shows a "Teacher Register" window with the title "Teacher Registration". The form contains the following fields and their values:

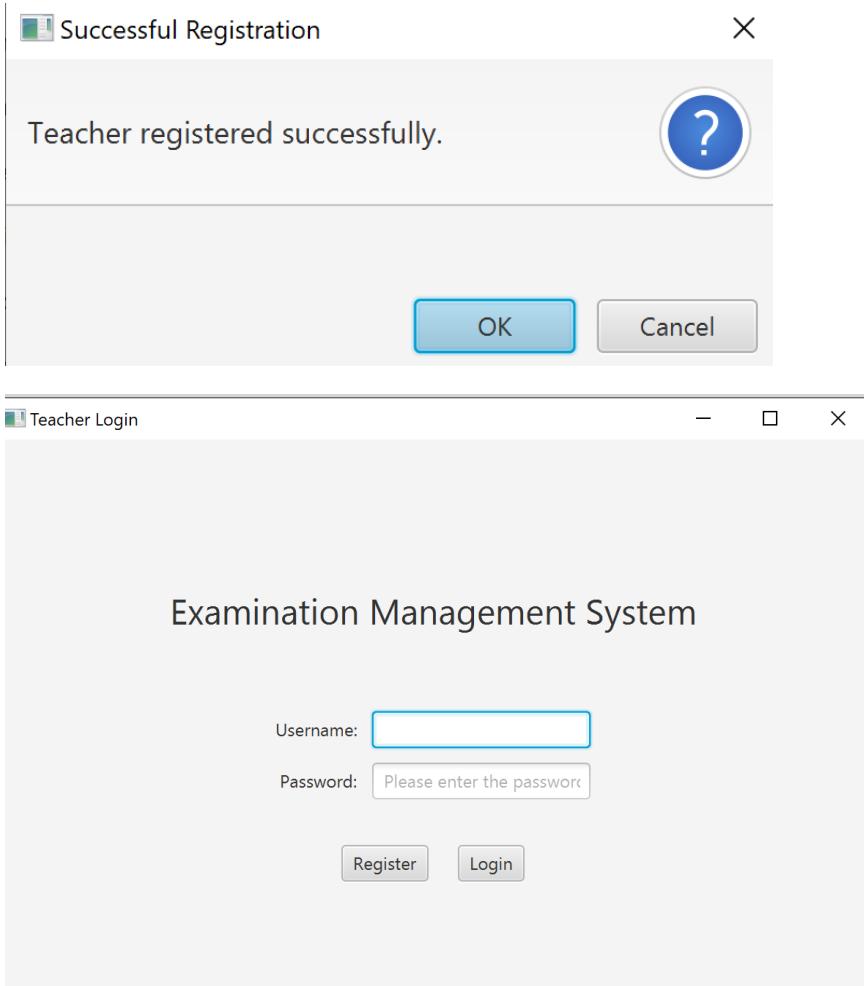
Username	teacher1
Name	Teacher A
Gender	Male
Age	33
Position	Instructor
Department	COMP
Password	*****
Confirmed Password	*****

Below the form, a note says "Password should contain:" followed by a list of rules:

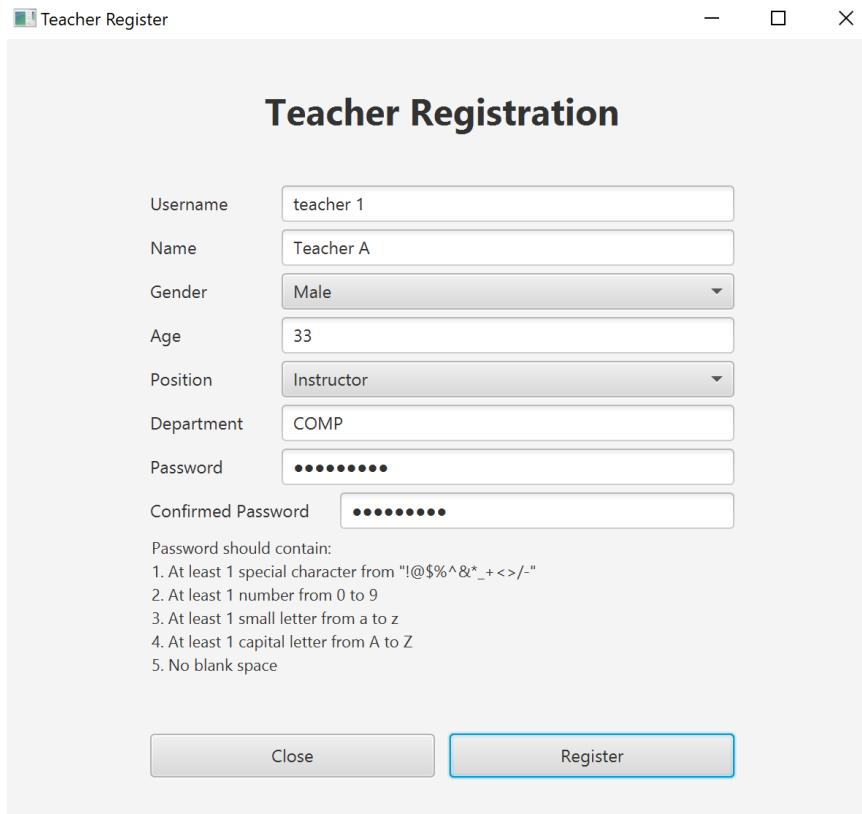
1. At least 1 special character from "!@#\$%^&*_=;<>/-"
2. At least 1 number from 0 to 9
3. At least 1 small letter from a to z
4. At least 1 capital letter from A to Z
5. No blank space

At the bottom are two buttons: "Close" and "Register".

Output: Prompt successful registration message and redirect to Teacher Login Page



Username input containing blanks: Input a username containing blank (e.g. teacher 1) in-between and click “Register”



A screenshot of a "Teacher Registration" form window. The window title is "Teacher Register". The form fields are as follows:

Username	teacher 1
Name	Teacher A
Gender	Male
Age	33
Position	Instructor
Department	COMP
Password	*****
Confirmed Password	*****

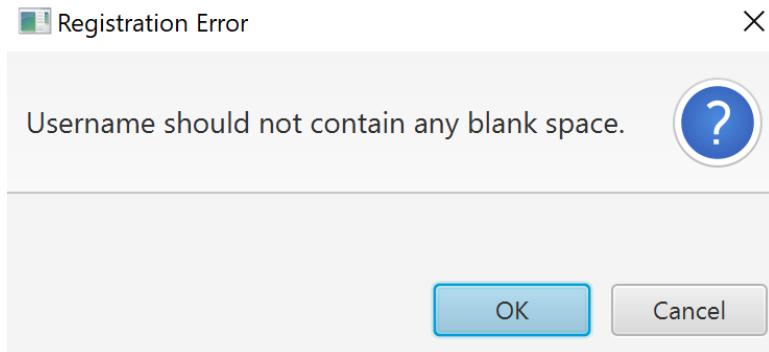
Below the form, there is a note about password requirements:

Password should contain:

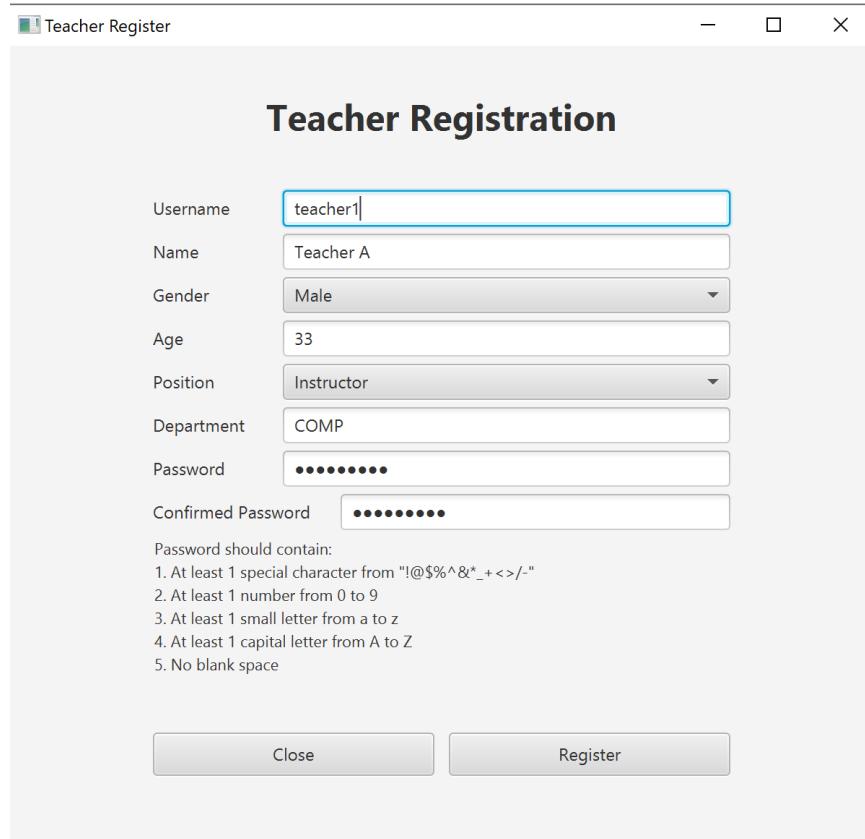
1. At least 1 special character from "!@#\$%^&*_-<>/-"
2. At least 1 number from 0 to 9
3. At least 1 small letter from a to z
4. At least 1 capital letter from A to Z
5. No blank space

At the bottom are two buttons: "Close" and "Register".

Output: Following error message prompted and registration terminated



Repeated username input: Re-input the one of the registered usernames (e.g. teacher1) and click “Register”



A screenshot of a "Teacher Registration" form window titled "Teacher Register". The form fields are as follows:

Username	teacher1
Name	Teacher A
Gender	Male
Age	33
Position	Instructor
Department	COMP
Password	*****
Confirmed Password	*****

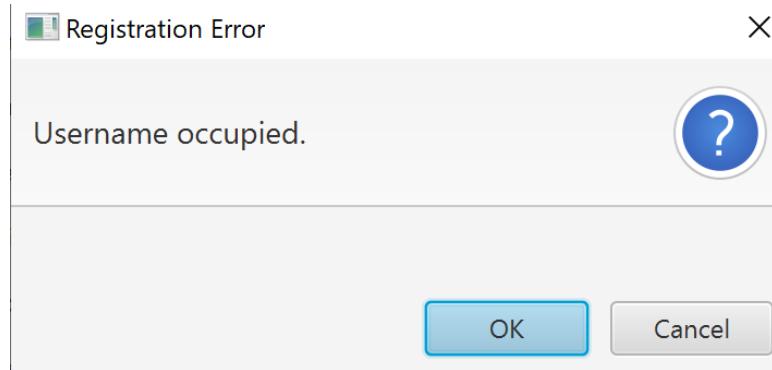
Below the form, a password requirement message states:

Password should contain:

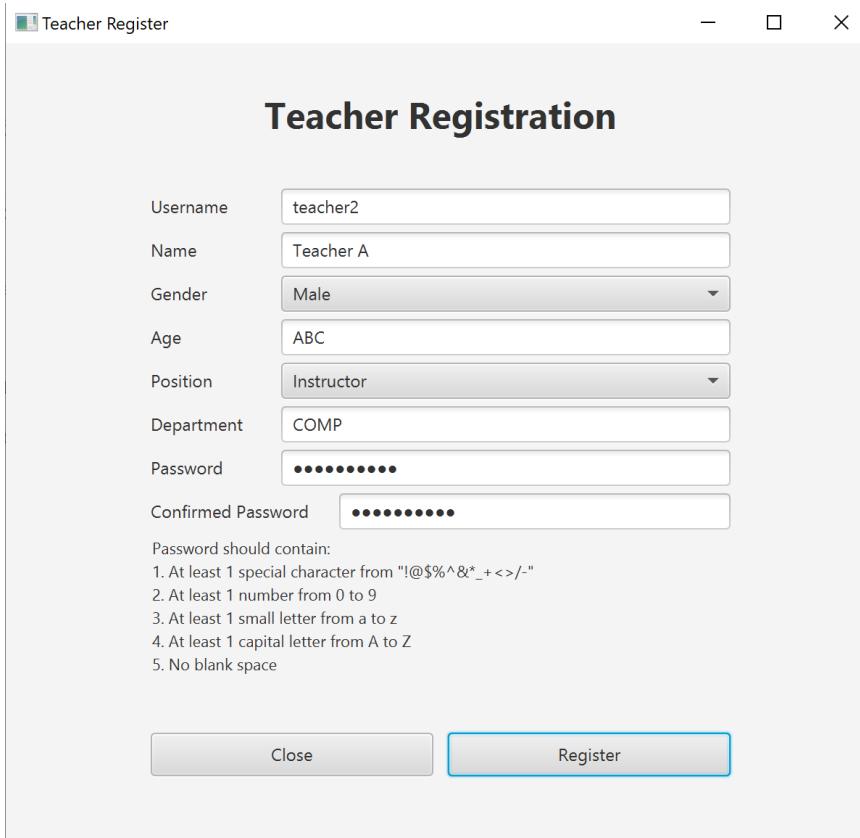
1. At least 1 special character from "!@#\$%^&* _<>/-"
2. At least 1 number from 0 to 9
3. At least 1 small letter from a to z
4. At least 1 capital letter from A to Z
5. No blank space

At the bottom are two buttons: "Close" and "Register".

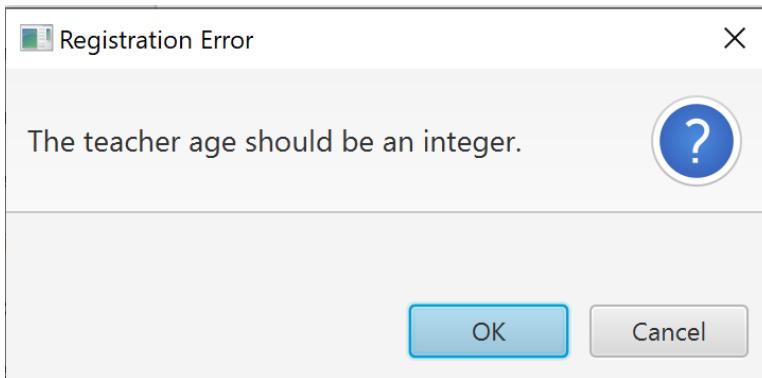
Output: Following error message prompted and registration terminated



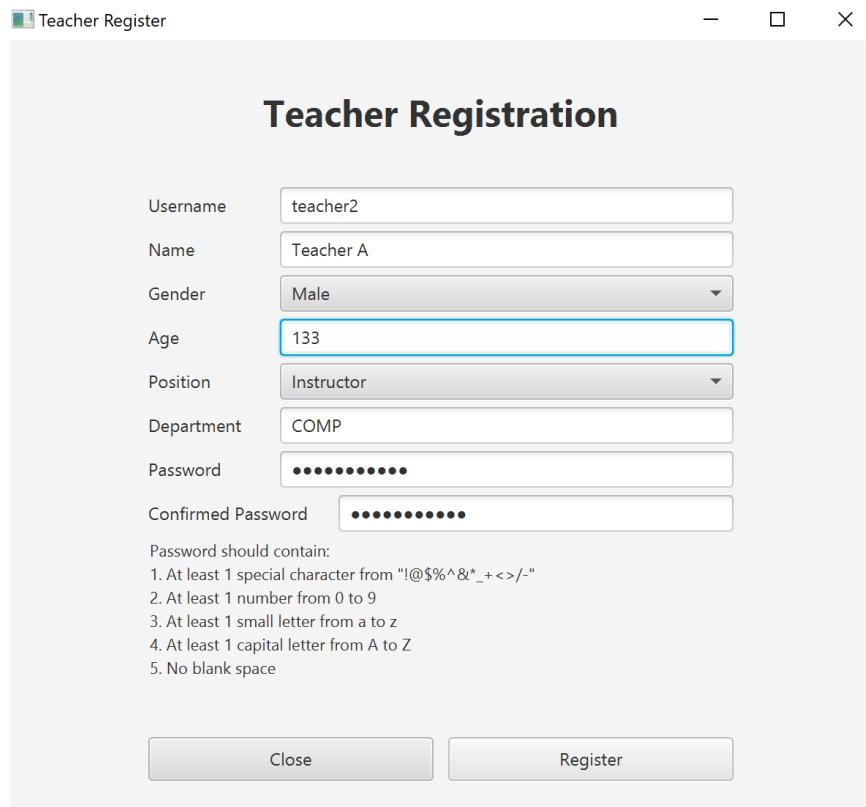
Non-integer age input: Input alphabetic/ symbol in age field (e.g. ABC) and click “Register”



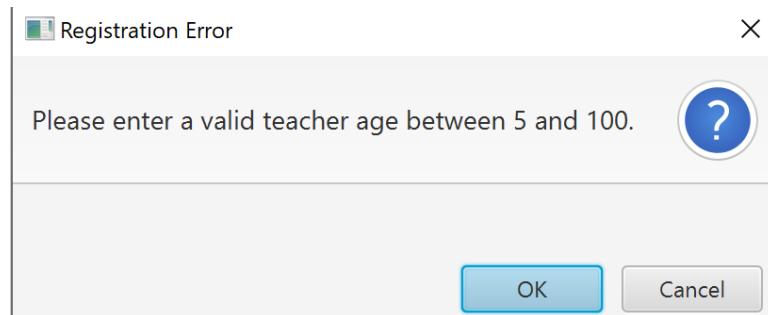
Output: Following error message prompted and registration terminated



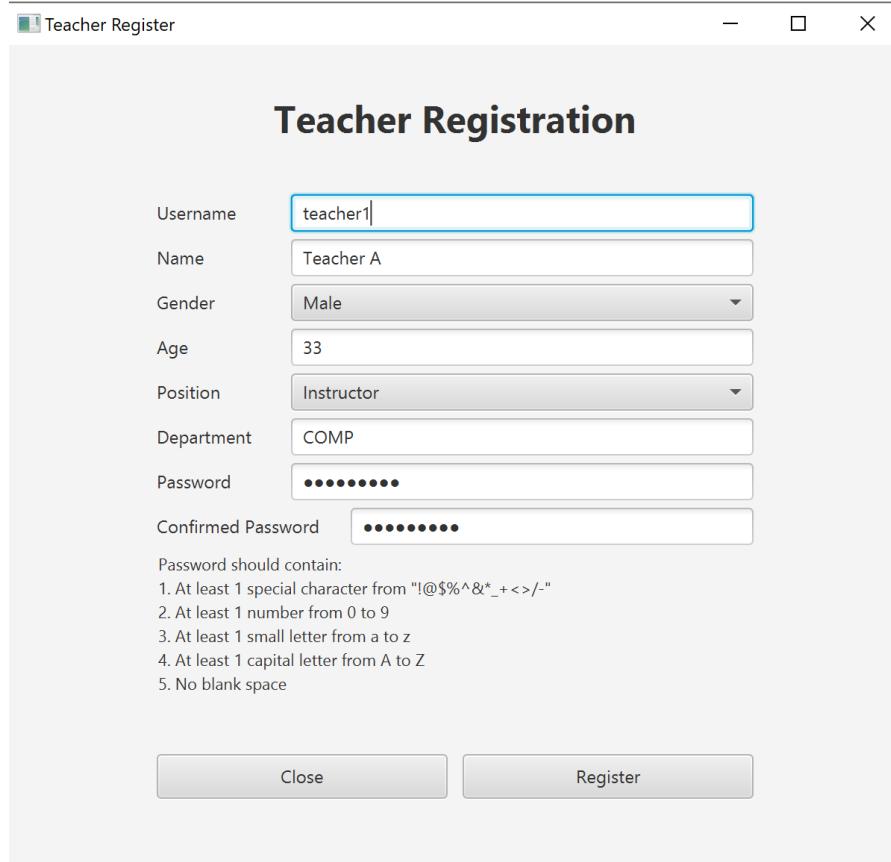
Age out of range: Input a negative age, zero or age out of range [5, 100] and click “Register”



Output: Following error message prompted and registration terminated



Password containing blank input: Input a password with blank in-between (e.g. 123 Abc!@) and click “Register”



The screenshot shows a "Teacher Registration" form window titled "Teacher Register". The form fields are as follows:

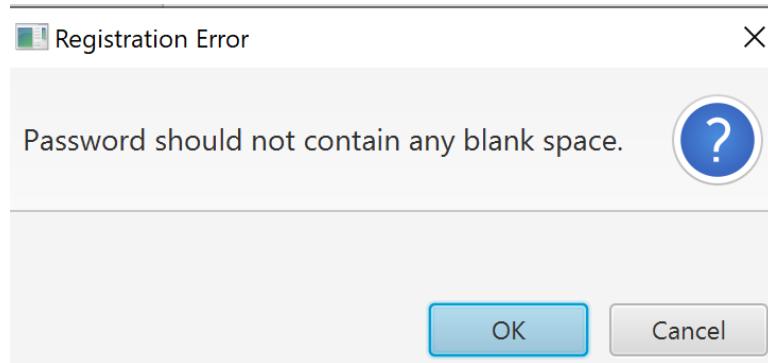
Username	teacher1
Name	Teacher A
Gender	Male
Age	33
Position	Instructor
Department	COMP
Password	••••••••
Confirmed Password	••••••••

Below the form, a note says "Password should contain:" followed by a list of five rules:

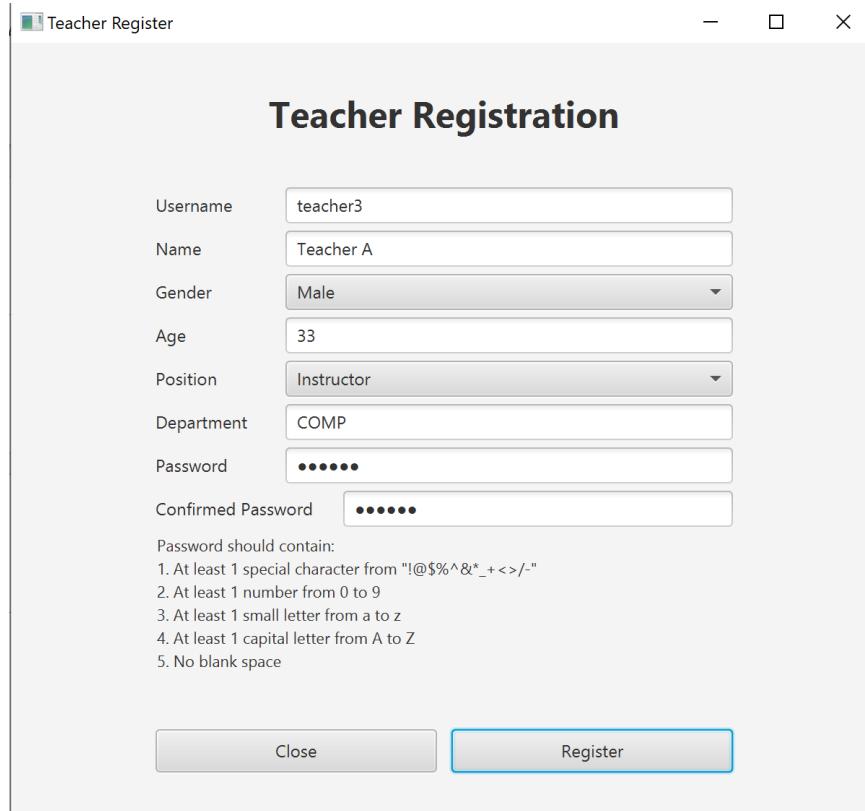
1. At least 1 special character from "!@#\$%^&*+_<>/-"
2. At least 1 number from 0 to 9
3. At least 1 small letter from a to z
4. At least 1 capital letter from A to Z
5. No blank space

At the bottom are "Close" and "Register" buttons.

Output: Following error message prompted and registration terminated



Too small password length: Input password with length less than 8 ([e.g. Ab1!@#](#)) and click “Register”



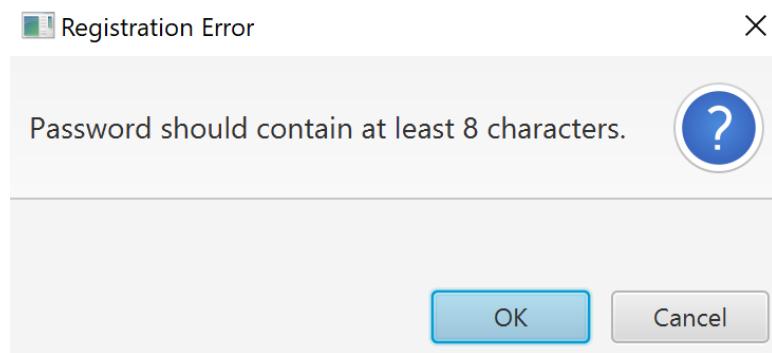
The screenshot shows a "Teacher Registration" form window titled "Teacher Register". The form fields include:

Username	teacher3
Name	Teacher A
Gender	Male
Age	33
Position	Instructor
Department	COMP
Password	*****
Confirmed Password	*****

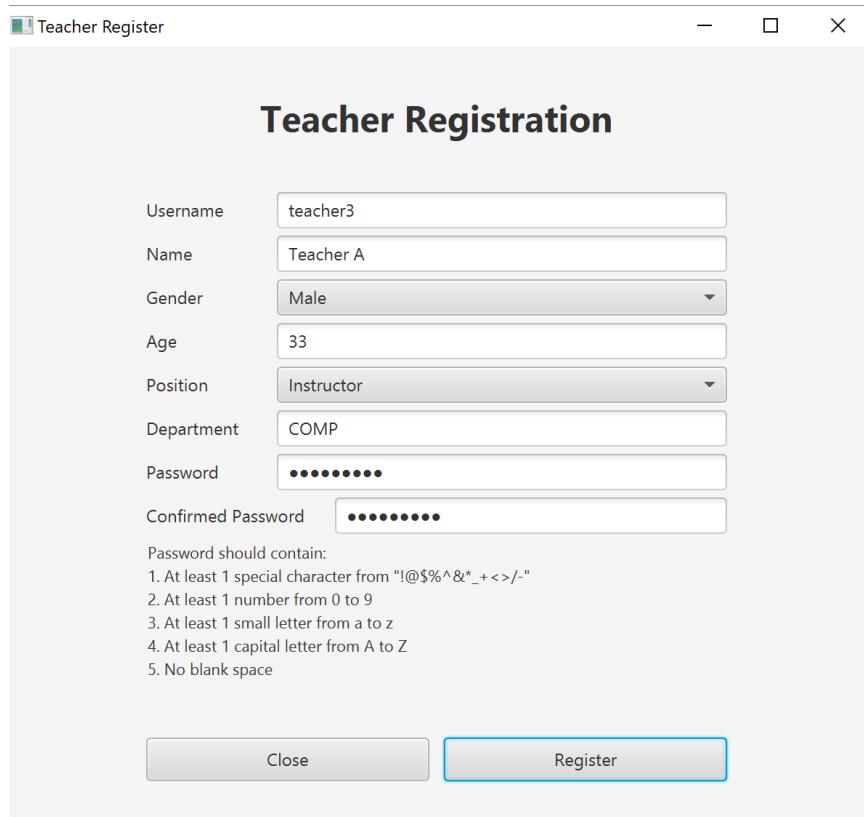
Below the form, a note states: "Password should contain:
1. At least 1 special character from '!@#\$%^&*_+<>/-'
2. At least 1 number from 0 to 9
3. At least 1 small letter from a to z
4. At least 1 capital letter from A to Z
5. No blank space".

At the bottom are "Close" and "Register" buttons.

Output: Following error message prompted and registration terminated



Password without number: Input password containing no number (e.g. AbcDef!@#) and click “Register”

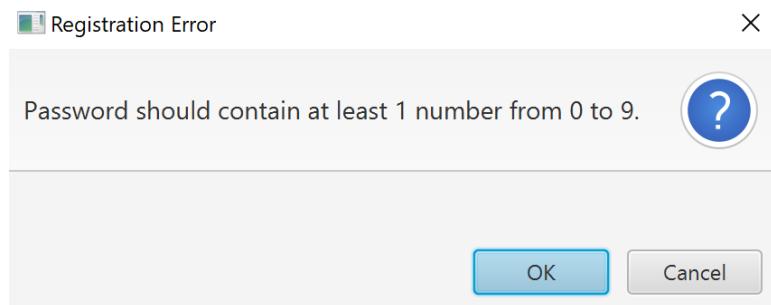


The screenshot shows a "Teacher Registration" dialog box. It contains fields for Username (teacher3), Name (Teacher A), Gender (Male), Age (33), Position (Instructor), Department (COMP), and Password (a series of dots). The Confirmed Password field also contains a series of dots. Below the fields is a list of password requirements:

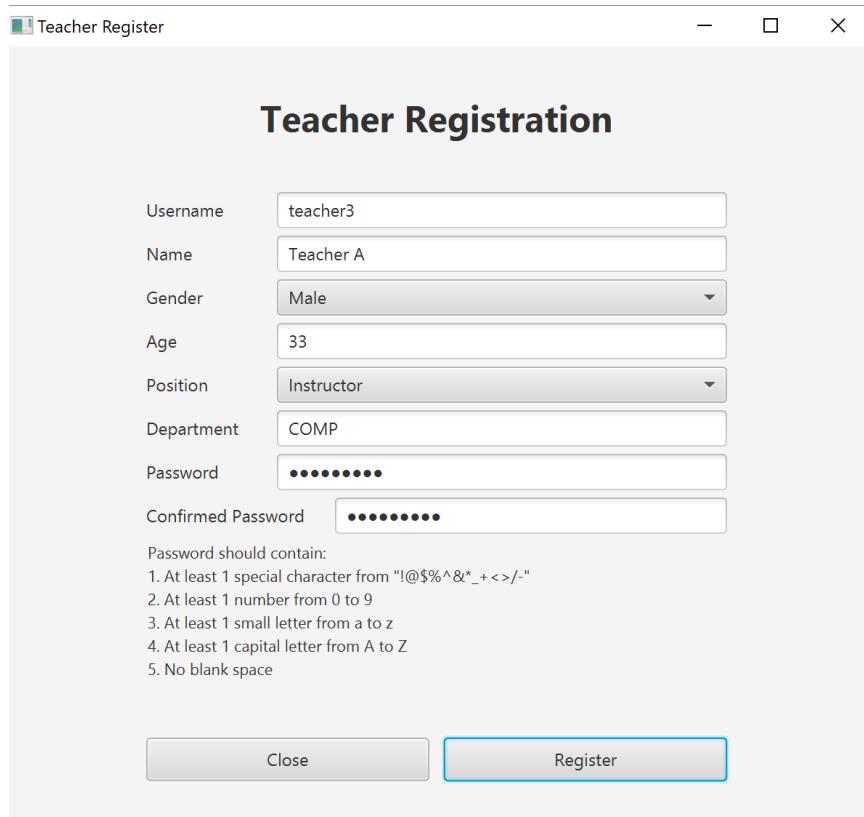
- 1. At least 1 special character from "!@#\$%^&*_-<>/-"
- 2. At least 1 number from 0 to 9
- 3. At least 1 small letter from a to z
- 4. At least 1 capital letter from A to Z
- 5. No blank space

At the bottom are "Close" and "Register" buttons, with "Register" being highlighted.

Output: Following error message prompted and registration terminated



Password without capital letters: Input password containing no capital letters (e.g. 123abc!@#) and click “Register”



The screenshot shows a "Teacher Registration" form window titled "Teacher Register". The form fields are as follows:

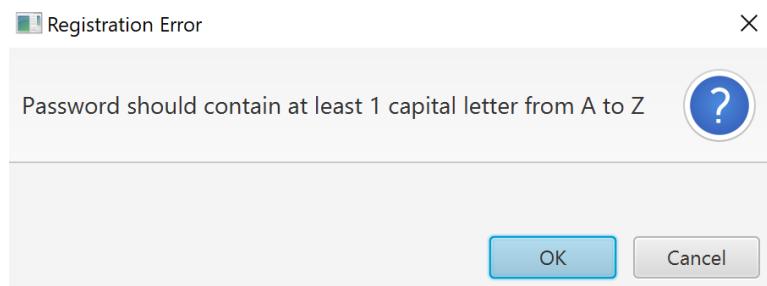
Username	teacher3
Name	Teacher A
Gender	Male
Age	33
Position	Instructor
Department	COMP
Password	*****
Confirmed Password	*****

Below the form, a note says "Password should contain:" followed by a list of five rules:

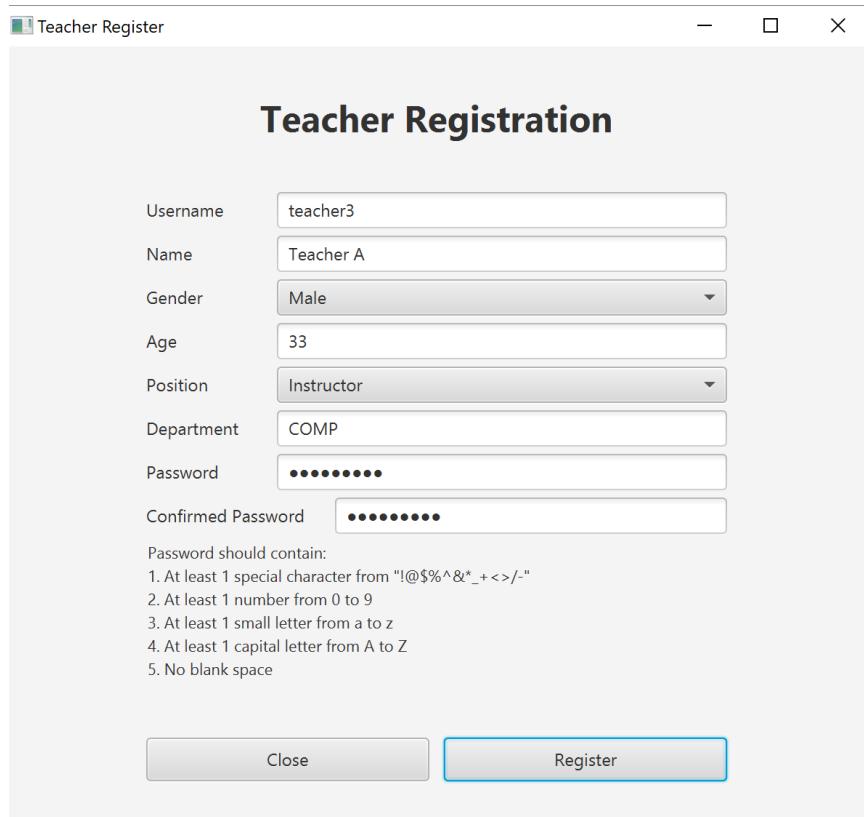
1. At least 1 special character from "!@#\$%^&*_-<>/-"
2. At least 1 number from 0 to 9
3. At least 1 small letter from a to z
4. At least 1 capital letter from A to Z
5. No blank space

At the bottom are two buttons: "Close" and "Register", with "Register" being highlighted.

Output: Following error message prompted and registration terminated



Password without small letters: Input password containing no capital letters (e.g. 123ABC!@#) and click “Register”

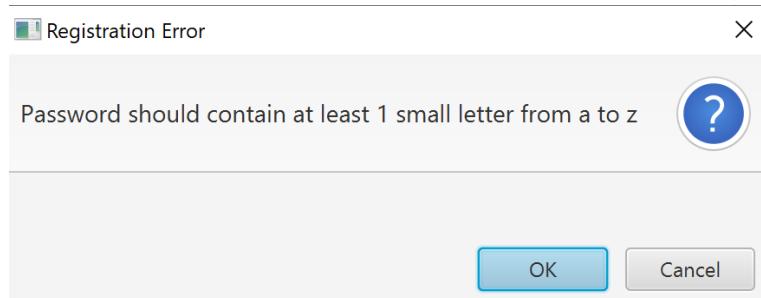


The screenshot shows a "Teacher Registration" dialog box. It contains fields for Username (teacher3), Name (Teacher A), Gender (Male), Age (33), Position (Instructor), Department (COMP), Password (a series of dots), and Confirmed Password (a series of dots). Below these fields is a list of password requirements:

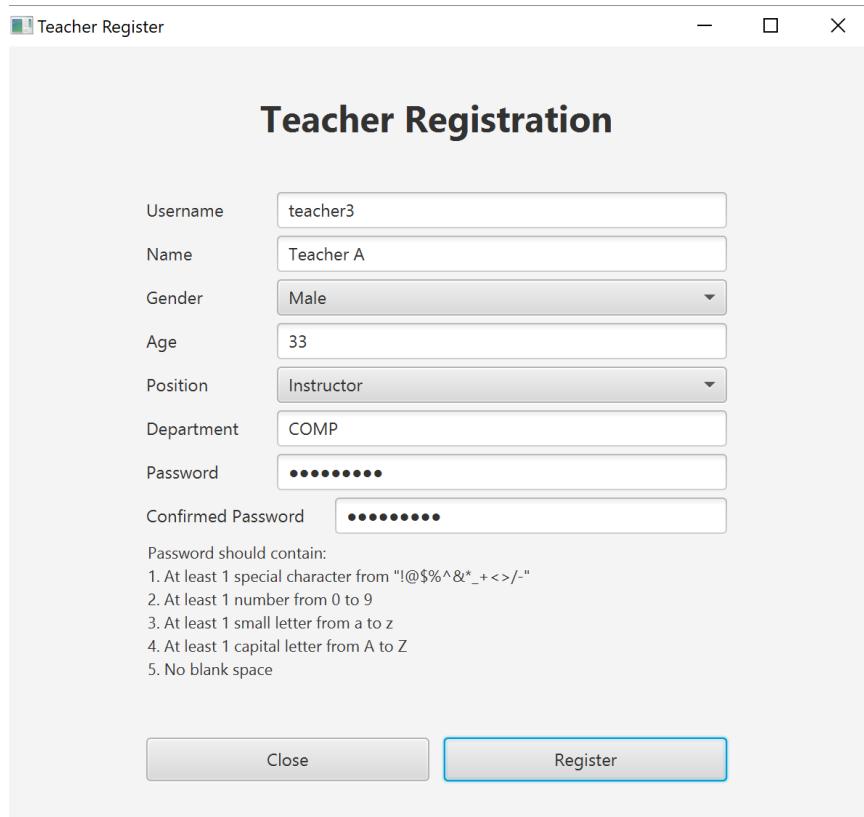
- 1. At least 1 special character from "!@#\$%^&*_-<>/-"
- 2. At least 1 number from 0 to 9
- 3. At least 1 small letter from a to z
- 4. At least 1 capital letter from A to Z
- 5. No blank space

At the bottom are "Close" and "Register" buttons, with "Register" being highlighted.

Output: Following error message prompted and registration terminated



Password without special characters: Input password containing no capital letters (e.g. 123AbcDef) and click “Register”

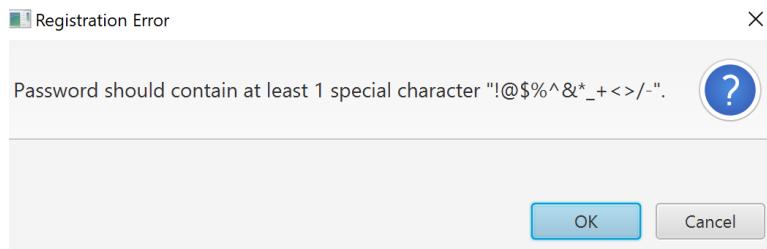


The screenshot shows a "Teacher Registration" dialog box. It contains fields for Username (teacher3), Name (Teacher A), Gender (Male), Age (33), Position (Instructor), Department (COMP), Password (a series of dots), and Confirmed Password (a series of dots). Below these fields is a list of password requirements:

- 1. At least 1 special character from "!@#\$%^&*_-<>/-"
- 2. At least 1 number from 0 to 9
- 3. At least 1 small letter from a to z
- 4. At least 1 capital letter from A to Z
- 5. No blank space

At the bottom are "Close" and "Register" buttons, with "Register" being highlighted.

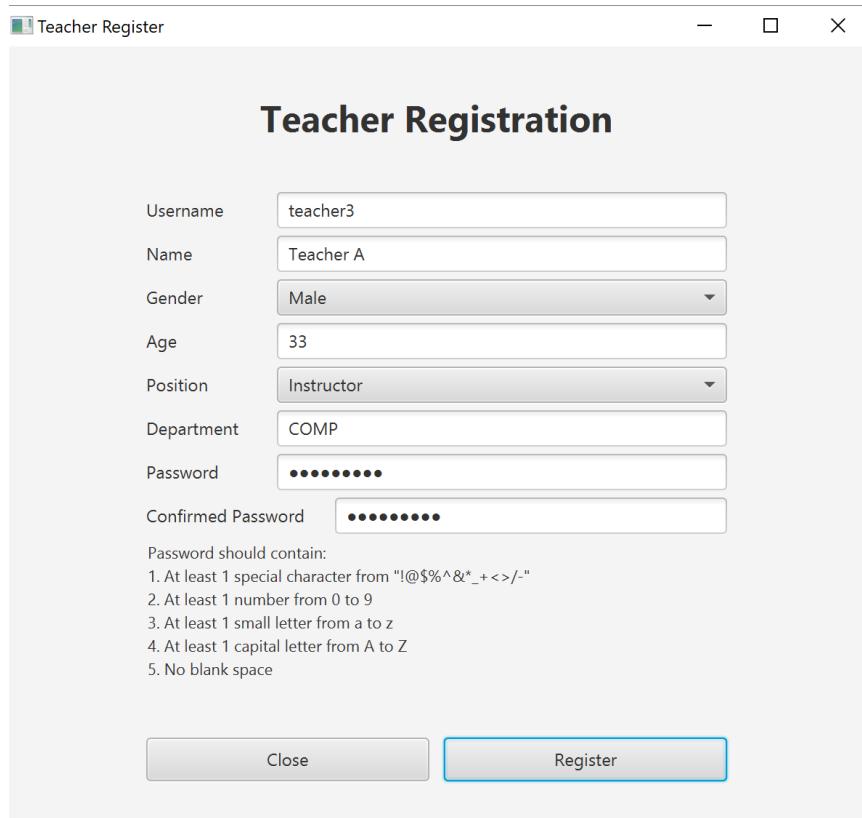
Output: Following error message prompted and registration terminated



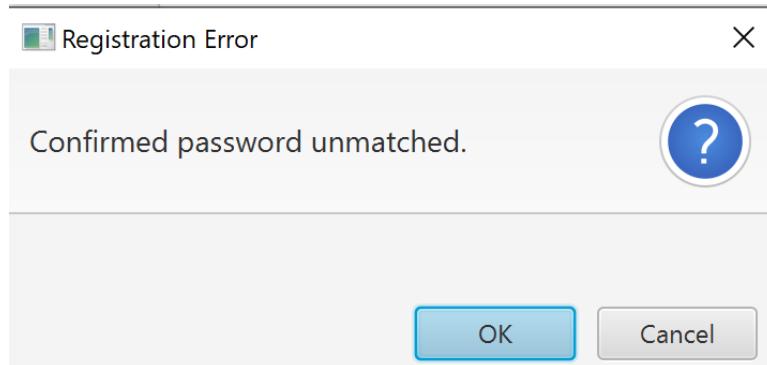
Confirmed password does not match with the password: Input password that is different from the password field and click “Register”

Sample input:

- Password: 123Abc!@#
- Confirm Password: 123AbcDef



Output: Following error message prompted and registration terminated



Blank input: Leaving any of the field blank

Sample input: Leaving username blank

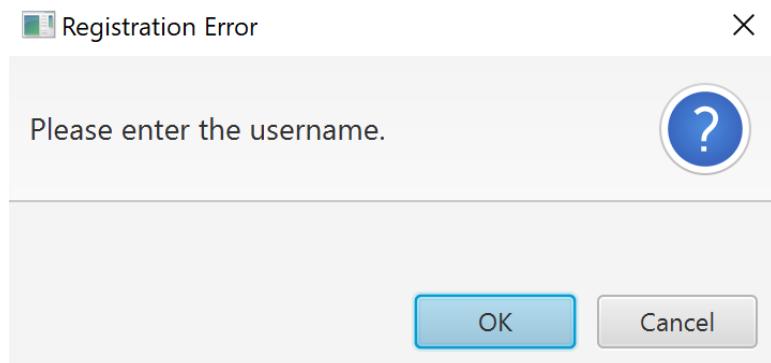
The screenshot shows a "Teacher Registration" dialog box. The "Username" field is empty and contains the placeholder text "Please enter the username". Other fields are populated with sample data: Name (Teacher A), Gender (Male), Age (33), Position (Instructor), Department (COMP), Password (a series of dots), and Confirmed Password (a series of dots). Below the form, a list of password requirements is displayed:

- 1. At least 1 special character from "!@#\$%^&*_=;<>/-"
- 2. At least 1 number from 0 to 9
- 3. At least 1 small letter from a to z
- 4. At least 1 capital letter from A to Z
- 5. No blank space

At the bottom are two buttons: "Close" and "Register", with "Register" being highlighted.

Output: Error message “Please enter the *field name*.” prompted and registration terminated

Sample output when leaving username blank:

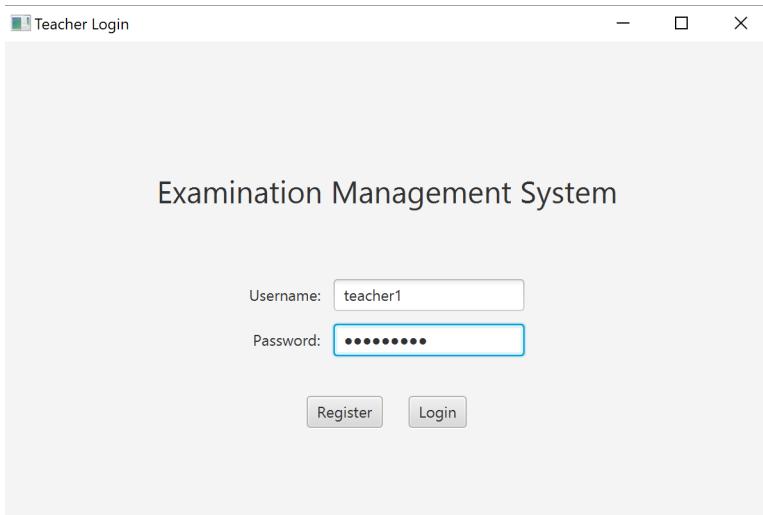


Teacher Login

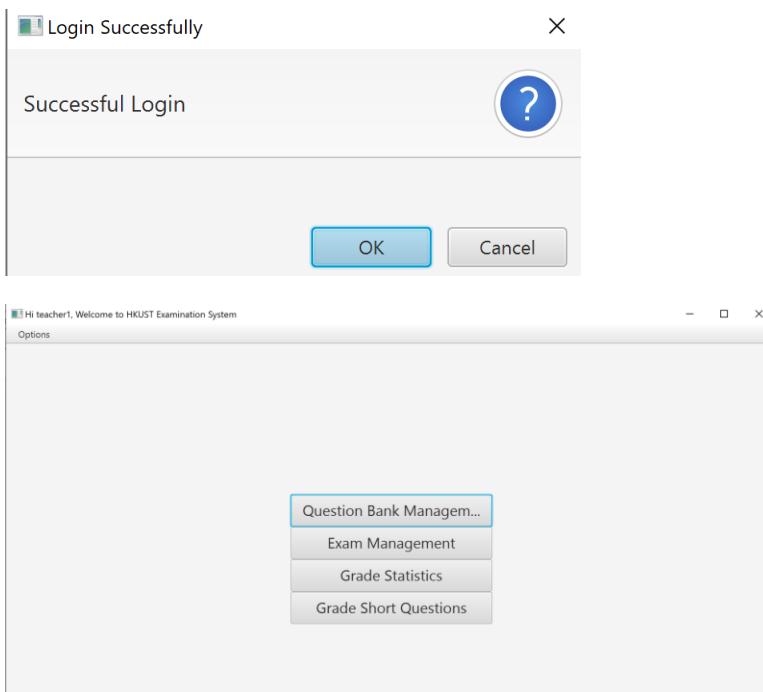
Normal login: Input the username and password of existing teacher account correctly and click “Login”

Sample input:

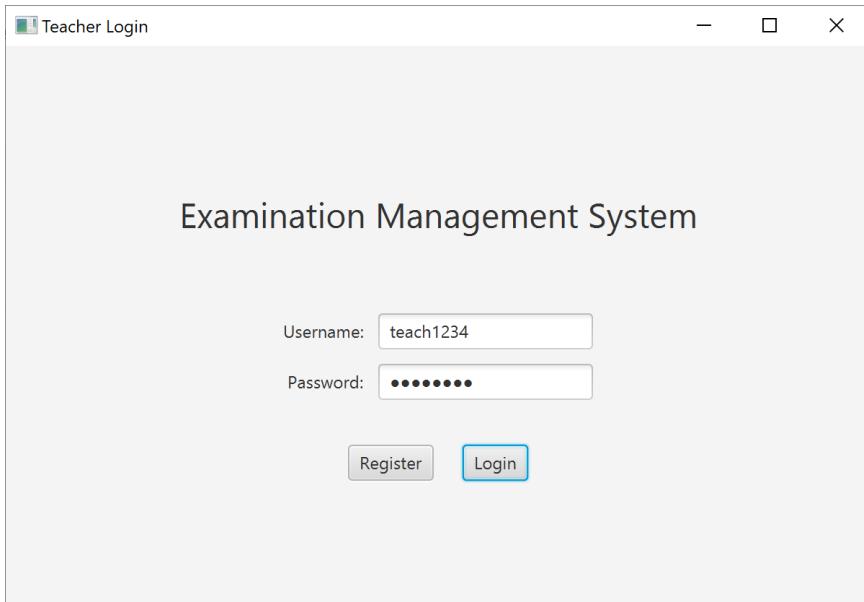
- Username: teacher1
- Password: 123Abc!@#



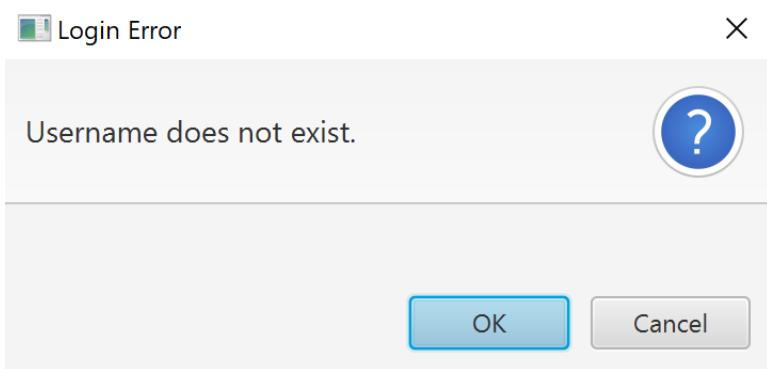
Output: Prompt successful login message and redirect to Teacher Main Page



Username unfound: Input teacher username that does not exist (e.g. teach1234) or leave username blank and click “Login”



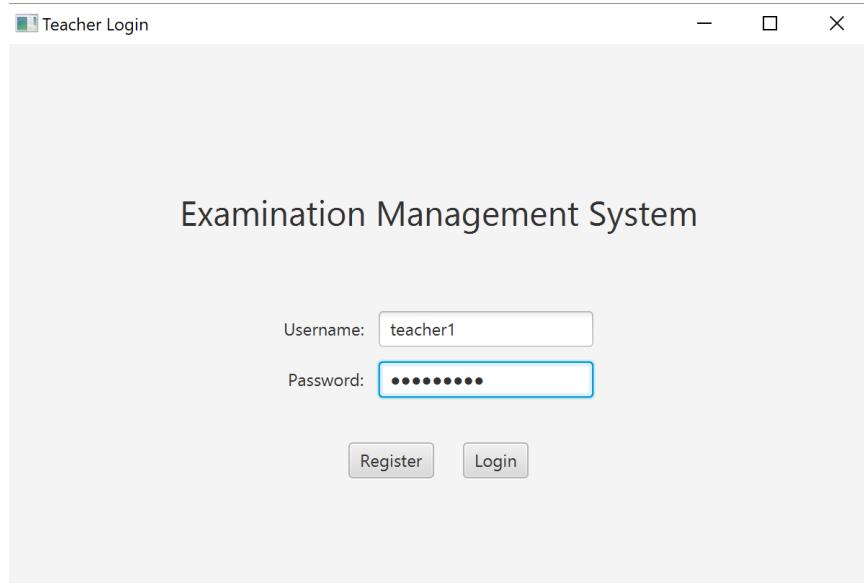
Output: Following error message prompted and login terminated



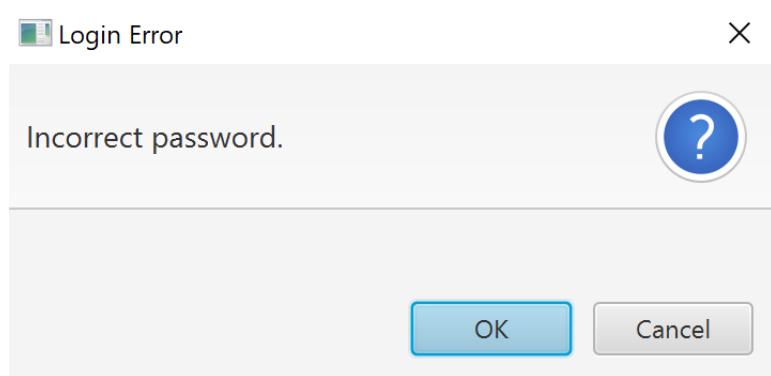
Incorrect password: Input existing teacher username and a password that does not match (or leave it blank) and click “Login”

Sample input:

- Username: teacher1
- Password: 123Def!@#

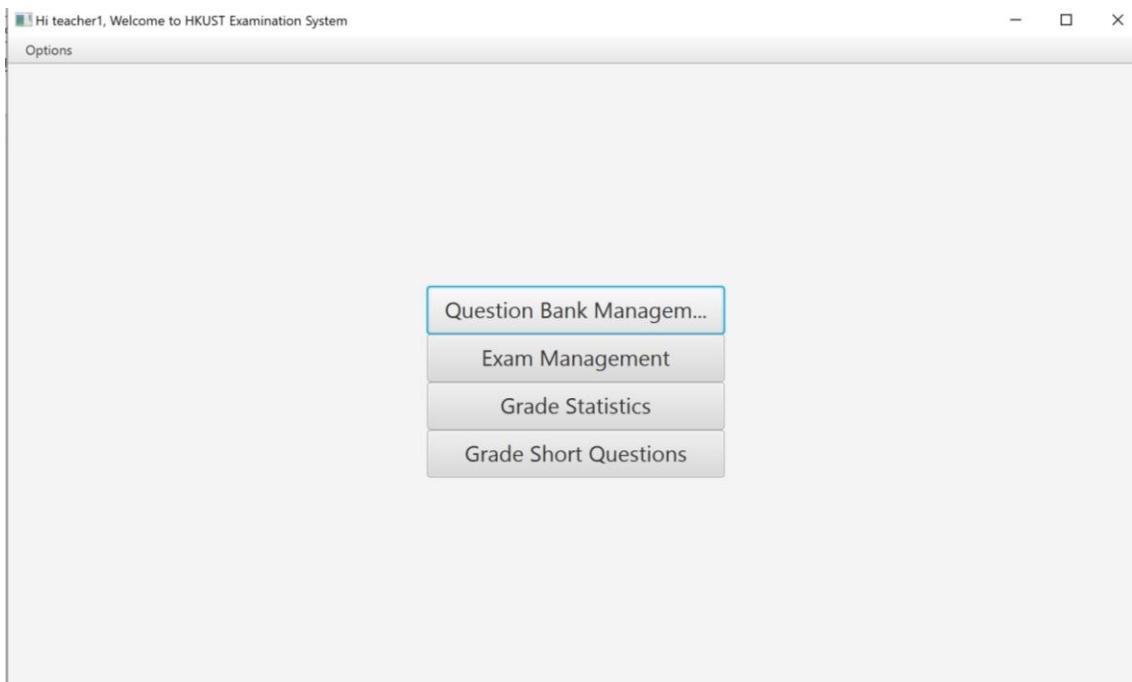


Output: Following error message prompted and login terminated



Question Bank Table

Start page: Click “Question Bank Management” in Teacher Main Page



Output: Start Question Bank Management Page and load all question data from database and shown in the table

Question Management Bank

Question	Type	Score	Reset	Filter				
Question	Option A	Option B	Option C	Option D	Answer	Type	Time	Question
Single Question?	Single Answe...	Single Answe...	Single Answe...	Single Answe...	D	single	34	<input type="text"/>
Single Question: ans=A 1732518871666	A	B	C	D	A	single	5	Option A <input type="text"/>
Multiple Question: ans=AB 173251887...	A	B	C	D	AB	multiple	10	Option B <input type="text"/>
T/F Question: ans=T 1732518871685	---	---	---	---	T	true false	5	Option C <input type="text"/>
Short Question: ans=Short Question1...	---	---	---	---	Short Question	short	20	Option D <input type="text"/>
								Answer <input type="text"/>
								Type <input type="text"/>
								Score <input type="text"/>

Question selection: Select a question from the table

Output: Question form on right automatically fills in the information of selected question.
“Delete” and “Update” button enabled

Question Management Bank

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question?	Single Answe...	Single Answe...	Single Answe...	Single Answe...	D	single	34
Single Question: ans=A 1732518871666	A	B	C	D	A	single	5
Multiple Question: ans=AB 173251887...	A	B	C	D	AB	multiple	10
T/F Question: ans=T 1732518871685	---	---	---	---	T	true false	5
Short Question: ans=Short Question1...	---	---	---	---	Short Question	short	20

Question
Single Question?

Option A
Single Answer 1

Option B
Single Answer 2

Option C
Single Answer 3

Option D
Single Answer 4

Answer
D

Type
single

Score
34

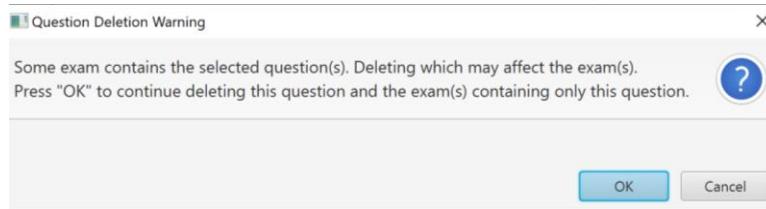
Refresh Delete Update Add

Question Deletion

Normal question deletion: Select a question from table and click “Delete”

The screenshot shows a web-based application titled "Question Management Bank". At the top, there is a search bar with fields for "Question", "Type" (set to "all"), "Score", and buttons for "Reset" and "Filter". Below the search bar is a table with columns: Question, Option A, Option B, Option C, Option D, Answer, Type, and Time. The table contains several rows of question data, including "Single Question?", "Single Question: ans=A 1732518871666", "Multiple Question: ans=AB 173251887...", and "T/F Question: ans=T 1732518871685". To the right of the table, a detailed view of a selected question is displayed. This view includes input fields for "Question", "Option A", "Option B", "Option C", "Option D", "Answer", "Type" (set to "short"), and "Score" (set to 20). Buttons for "Refresh", "Delete", "Update", and "Add" are located at the bottom of the interface.

Output 1: If the question is included in some exam, the following message prompted. If click “OK”, continue deletion with related exam affected; else, terminate deletion.



Output 2: If the question is not being used or “OK” is clicked in output 1, the following message prompted, table is refreshed with selected question deleted, form cleared, and nothing selected in the table

Successful Question Deletion

Question deleted successfully.

?

OK Cancel

Question Management Bank

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question?	Single Answe...	Single Answe...	Single Answe...	Single Answe...	D	single	34
Single Question: ans=A 1732518871666	A	B	C	D	A	single	5
Multiple Question: ans=AB 173251887...	A	B	C	D	AB	multiple	10
T/F Question: ans=T 1732518871685	---	---	---	---	T	true false	5

Question

Option A

Option B

Option C

Option D

Answer

Type

Score

Refresh Delete Update Add

Question Filtering

Normal filtering: Input valid question filter and click “Filter”

Sample input:

- Question: Question
- Score: 34
- Type: single

The screenshot shows a window titled "Question Management Bank". At the top, there are four input fields: "Question" (containing "Question"), "Type" (set to "single"), "Score" (set to "10"), and a "Filter" button. To the right of these are three empty text input boxes labeled "Question", "Option A", and "Option B". Below the input area is a table with columns: Question, Option A, Option B, Option C, Option D, Answer, Type, and Time. The table contains three rows of data, all of which are deselected.

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question?	Single Answe...	Single Answe...	Single Answe...	Single Answe...	D	single	34
Single Question: ans=A 1732518871666	A	B	C	D	A	single	5
Multiple Question: ans=AB 173251887...	A	B	C	D	AB	multiple	10

Output: Question table filtered based on the input. Question field performs fuzzy matching while others perform exact matching. All rows are deselected, and question form cleared.

The screenshot shows the same "Question Management Bank" window after filtering. The "Question" input field now contains "34", and the "Type" dropdown is set to "single". The "Filter" button is highlighted with a blue border. The table below shows only the second row from the previous screenshot, where "ans=A" matches the score "34". The question form on the right is now cleared, with all input fields empty.

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question: ans=A 1732518871666	A	B	C	D	A	single	5

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

Refresh Delete Update Add

Filter reset: Input something in the filter and click reset

The screenshot shows the 'Question Management Bank' application window. At the top, there is a toolbar with buttons for 'Question', 'Type', 'Score', 'Reset', and 'Filter'. The 'Score' field contains the value '10'. To the right of the toolbar, there are two input fields: 'Question' and 'Option A', both of which are currently empty. Below the toolbar is a table with columns: Question, Option A, Option B, Option C, Option D, Answer, Type, and Time. The table contains three rows of data.

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question?	Single Answe...	Single Answe...	Single Answe...	Single Answe...	D	single	34
Single Question: ans=A 1732518871666	A	B	C	D	A	single	5

Output: The filter is reset with all text field empty and type set to “all”

The screenshot shows the 'Question Management Bank' application window. The 'Type' dropdown menu is set to 'all'. The 'Score' field is empty. To the right of the toolbar, there are two input fields: 'Question' and 'Option A', both of which are currently empty. Below the toolbar is a table with columns: Question, Option A, Option B, Option C, Option D, Answer, Type, and Time. The table contains three rows of data.

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question?	Single Answe...	Single Answe...	Single Answe...	Single Answe...	D	single	34
Single Question: ans=A 1732518871666	A	B	C	D	A	single	5

Filter with blank field: Leave any of the filter text field blank and click “Filter”

The screenshot shows the 'Question Management Bank' application window. The 'Question' input field is empty, while the 'Type' dropdown menu is set to 'single'. The 'Score' field is empty. To the right of the toolbar, there are two input fields: 'Question' and 'Option A', both of which are currently empty. Below the toolbar is a table with columns: Question, Option A, Option B, Option C, Option D, Answer, Type, and Time. The table contains three rows of data.

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question?	Single Answe...	Single Answe...	Single Answe...	Single Answe...	D	single	34
Single Question: ans=A 1732518871666	A	B	C	D	A	single	5

Output: Blank field is not considered in filtering. Filter is performed accordingly.

The screenshot shows the 'Question Management Bank' application window. The 'Question' input field is empty, while the 'Type' dropdown menu is set to 'single'. The 'Score' field is empty. To the right of the toolbar, there are two input fields: 'Question' and 'Option A', both of which are currently empty. Below the toolbar is a table with columns: Question, Option A, Option B, Option C, Option D, Answer, Type, and Time. The table contains three rows of data.

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question?	Single Answe...	Single Answe...	Single Answe...	Single Answe...	D	single	34
Single Question: ans=A 1732518871666	A	B	C	D	A	single	5

Filter with non-integer score: Input any non-integer in score field and click “Filter”

The screenshot shows a Windows application window titled "Question Management Bank". At the top, there is a toolbar with buttons for "Question", "Type", "Score", "Reset", and "Filter". The "Score" field contains the non-integer value "ABC". Below the toolbar is a table with columns: Question, Option A, Option B, Option C, Option D, Answer, Type, and Time. One row in the table is highlighted, showing a question with options A, B, C, D and answer A, type single, time 34. To the right of the table is a sidebar with fields for "Question", "Option A", "Option B", "Option C", "Option D", "Answer", "Type", and "Score". The "Score" field in the sidebar also contains "ABC". At the bottom of the window are buttons for "Refresh", "Delete", "Update", and "Add".

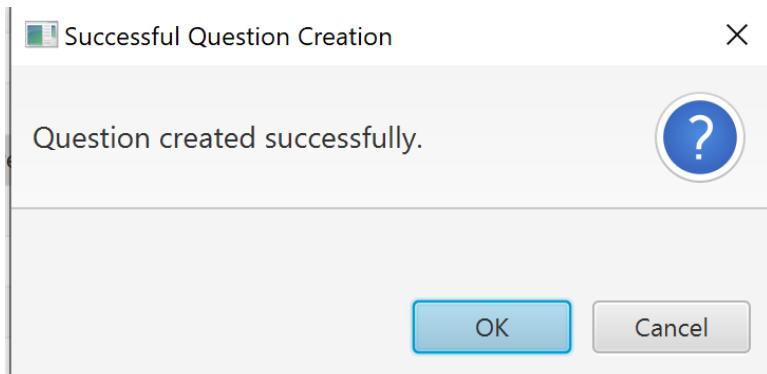
Output:



Question Creation

Normal single question creation: Input valid information of single question and click “Add”

Output: Successful creation message prompted, table refreshed, all rows deselected, form cleared



A window titled "Question Management Bank". It contains a table with columns: Question, Option A, Option B, Option C, Option D, Answer, Type, and Time. The table has several rows of data. To the right of the table is a sidebar with input fields for "Question", "Option A", "Option B", "Option C", "Option D", "Answer", "Type" (with a dropdown menu showing "single"), and "Score". At the bottom are "Refresh", "Delete", "Update", and "Add" buttons.

Normal multiple question creation: Select “Multiple” question type, input valid information of multiple question and click “Add”

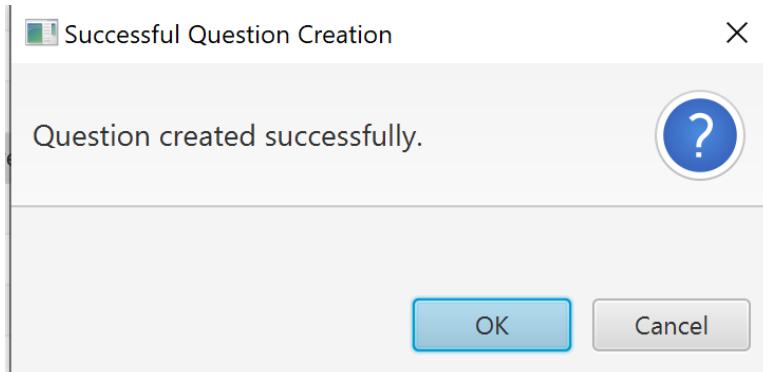
Question Management Bank

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question?	Single Answe...	Single Answe...	Single Answe...	D	single	34	
Single Question: ans=A 1732536586988	A	B	C	D	A	single	5
Multiple Question: ans=AB 173253658...	A	B	C	D	AB	multiple	10
T/F Question: ans=T 1732536587018	---	---	---	---	T	true false	5
Short Question: ans=Short Question1...	---	---	---	---	Short Question	short	20

Question
Multiple 1
Option A
Multiple 1
Option B
Multiple 2
Option C
Multiple 3
Option D
Multiple 4
Answer
AB
Type
multiple
Score
5q

Refresh Delete Update Add

Output: Successful creation message prompted, table refreshed, all rows deselected, form cleared



Question Management Bank

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question?	Single Answe...	Single Answe...	Single Answe...	Single Answe...	D	single	34
Single Question: ans=A 1732536586988	A	B	C	D	A	single	5
Multiple Question: ans=AB 173253658...	A	B	C	D	AB	multiple	10
T/F Question: ans=T 1732536587018	---	---	---	---	T	true false	5
Short Question: ans=Short Question1...	---	---	---	---	Short Question	short	20
Multiple 1	Multiple 1	Multiple 2	Multiple 3	Multiple 4	AB	multiple	50

Form fields on the right:

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

Buttons at the bottom: Refresh, Delete, Update, Add

Normal short question creation: Select “Short” question type, input valid information for short question and click “Add”

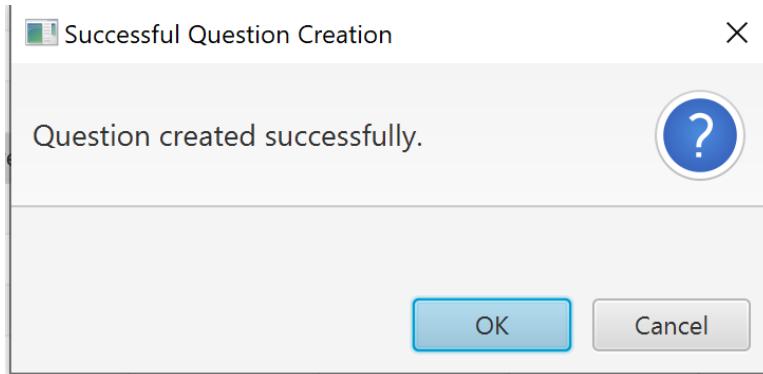
Question Management Bank

Question	Type	Score	Reset	Filter
Single Question?	single	34		
Single Question: ans=A 1732536586988	A	B	C	D
Multiple Question: ans=AB 173253658...	A	B	C	D
T/F Question: ans=T 1732536587018	---	---	---	T
Short Question: ans=Short Question1...	---	---	---	Short Question
Multiple 1	Multiple 1	Multiple 2	Multiple 3	Multiple 4
				AB
				multiple
				50

Question: Short 1
Option A:
Option B:
Option C:
Option D:
Answer: Short Ans
Type: short
Score: 343

Refresh Delete Update Add

Output: Successful creation message prompted, table refreshed, all rows deselected, form cleared

A window titled "Question Management Bank". The top bar includes input fields for "Question", "Type" (set to "all"), "Score", and buttons for "Reset" and "Filter". Below this is a table with columns: Question, Option A, Option B, Option C, Option D, Answer, Type, and Time. The table contains several rows of question data. To the right of the table is a sidebar with input fields for "Question", "Option A", "Option B", "Option C", "Option D", "Answer", "Type" (set to "single"), and "Score". At the bottom of the window are buttons for "Refresh", "Delete", "Update", and "Add".

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question?	Single Answe...	Single Answe...	Single Answe...	Single Answe...	D	single	34
Single Question: ans=A 1732536586988	A	B	C	D	A	single	5
Multiple Question: ans=AB 173253658...	A	B	C	D	AB	multiple	10
T/F Question: ans=T 1732536587018	---	---	---	---	T	true false	5
Short Question: ans=Short Question1...	---	---	---	---	Short Question	short	20
Multiple 1	Multiple 1	Multiple 2	Multiple 3	Multiple 4	AB	multiple	50
Short 1	---	---	---	---	Short Ans	short	343

Normal multiple question creation: Select “True False” question type, input valid information of true/ false question and click “Add”

Question Management Bank

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question?	Single Answer	Single Answer	Single Answer	D	single	34	
Single Question: ans=A 1732536586988	A	B	C	D	A	single	5
Multiple Question: ans=AB 173253658...	A	B	C	D	AB	multiple	10
T/F Question: ans=T 1732536587018	---	---	---	---	T	true false	5
Short Question: ans=Short Question1...	---	---	---	---	Short Question	short	20
Multiple 1	Multiple 1	Multiple 2	Multiple 3	Multiple 4	AB	multiple	50
Short 1	---	---	---	---	Short Ans	short	343

Question
True False

Option A
True

Option B
False

Option C

Option D

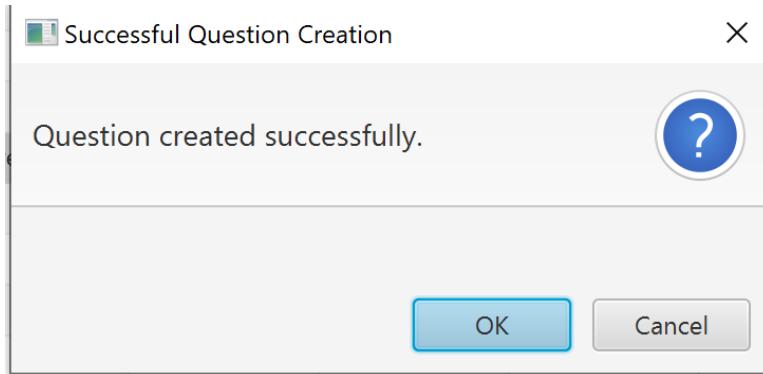
Answer
T

Type
true false

Score
345

Refresh Delete Update Add

Output: Successful creation message prompted, table refreshed, all rows deselected, form cleared



Question Management Bank

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question?	Single Answe...	Single Answe...	Single Answe...	Single Answe...	D	single	34
Single Question: ans=A 1732536586988	A	B	C	D	A	single	5
Multiple Question: ans=AB 173253658...	A	B	C	D	AB	multiple	10
T/F Question: ans=T 1732536587018	---	---	---	---	T	true false	5
Short Question: ans=Short Question1...	---	---	---	---	Short Question	short	20
Multiple 1	Multiple 1	Multiple 2	Multiple 3	Multiple 4	AB	multiple	50
Short 1	---	---	---	---	Short Ans	short	343
True False	True	False	---	---	T	true false	345

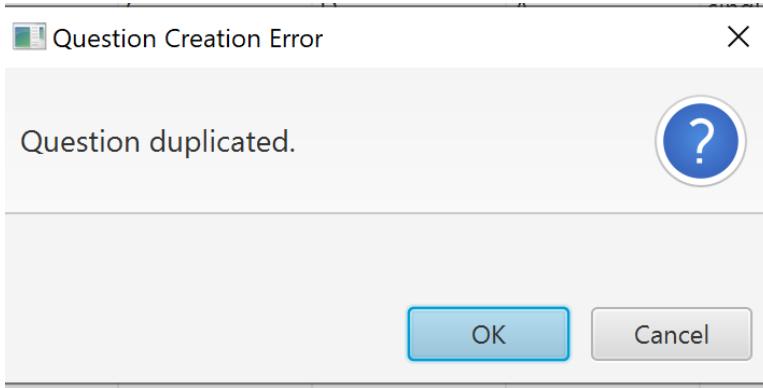
Question
Option A
Option B
Option C
Option D
Answer
Type
Score

Refresh Delete Update Add

Duplicated question creation: Select an existing question or input information exactly same as an existing question and click “Add”

The screenshot shows the 'Question Management Bank' application window. In the center, there is a table with columns: Question, Option A, Option B, Option C, Option D, Answer, Type, and Time. Two rows are visible: one for a 'Single Question?' and another for 'Single Question: ans=A 1732518871666'. The second row has values: Option A (A), Option B (B), Option C (C), Option D (D), Answer (A), Type (single), and Time (34). To the right of the table, a form is displayed for creating a new question. The 'Question' field contains 'Single Question'. The 'Type' dropdown is set to 'single'. Other fields include 'Option A' (A), 'Option B' (B), 'Option C' (C), 'Option D' (D), 'Answer' (A), and 'Score' (5). At the bottom right of the application window are buttons for Refresh, Delete, Update, and Add.

Output: Following error message prompted and question creation terminated



Non-integer score: Input a non-integer to score field and click “Add”

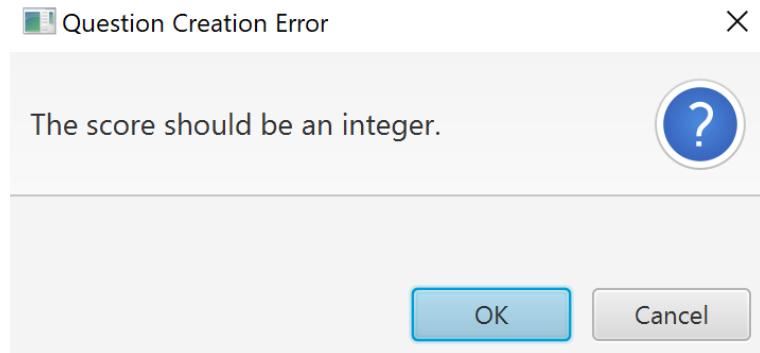
Question Management Bank

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question?	Single Answe...	Single Answe...	Single Answe...	Single Answe...	D	single	34
Single Question: ans=A 1732536586988	A	B	C	D	A	single	5
Multiple Question: ans=AB 173253658...	A	B	C	D	AB	multiple	10
T/F Question: ans=T 1732536587018	---	---	---	---	T	true false	5
Short Question: ans=Short Question1...	---	---	---	---	Short Question	short	20
Multiple 1	Multiple 1	ABC	Multiple 3	DEF	AB	multiple	123
Short 1	---	---	---	---	Short Ans	short	343
True False	True	False	---	---	T	true false	345
Short 1	---	---	---	---	Short Ans	short	343342432

Question: TF
Option A:
Option B:
Option C:
Option D:
Answer: T
Type: short
Score: erre

Refresh Delete Update Add

Output: Following error message prompted and question creation terminated



Blank input: Leaving any of the field blank and click “Add”

Sample input: Leaving score field blank

The screenshot shows a window titled "Question Management Bank". At the top, there are search and filter fields: "Question" (text input), "Type" (dropdown set to "all"), "Score" (text input), "Reset", and "Filter". Below this is a table with columns: Question, Option A, Option B, Option C, Option D, Answer, Type, and Time. The table contains several rows of question data. To the right of the table is a form for adding a new question:

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question?	Single Answe...	Single Answe...	Single Answe...	Single Answe...	D	single	34
Single Question: ans=A 1732536586988	A	B	C	D	A	single	5
Multiple Question: ans=AB 173253658...	A	B	C	D	AB	multiple	10
T/F Question: ans=T 1732536587018	---	---	---	---	T	true false	5
Short Question: ans=Short Question1...	---	---	---	---	Short Question	short	20
Multiple 1	Multiple 1	ABC	Multiple 3	DEF	AB	multiple	123
Short 1	---	---	---	---	Short Ans	short	343
True False	True	False	---	---	T	true false	345
Short 1	---	---	---	---	Short Ans	short	343342432

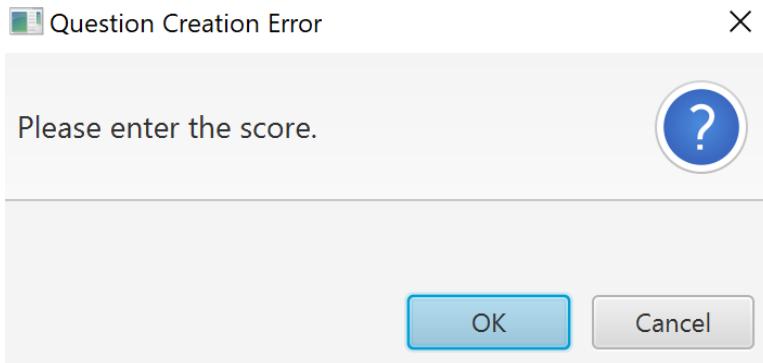
Form fields on the right:

- Question: TF
- Option A: (empty)
- Option B: (empty)
- Option C: (empty)
- Option D: (empty)
- Answer: T
- Type: short (dropdown)
- Score: (empty text input)

Buttons at the bottom: Refresh, Delete, Update, Add.

Output: Error message “Please enter the *field name*” is prompted, question creation terminated

Sample output:

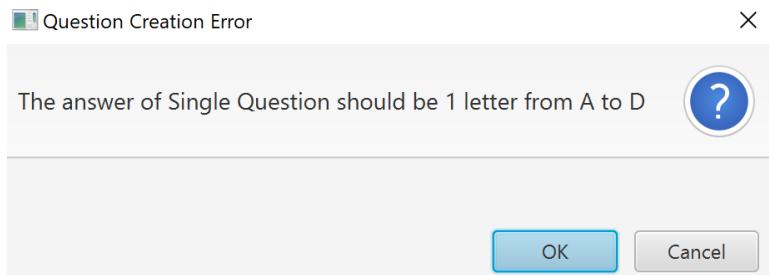


Invalid single answer: Input anything other than single letters from A to D in answer field with type selected as single and click “Add”

The screenshot shows the 'Question Management Bank' application window. On the left, a grid table displays various question types with their details. On the right, a sidebar provides input fields for creating a new question. The 'Answer' field contains 'trr', and the 'Type' dropdown is set to 'single'. The 'Score' field has '43' typed into it.

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question?	Single Answe...	Single Answe...	Single Answe...	Single Answe...	D	single	34
Single Question: ans=A 1732536586988	A	B	C	D	A	single	5
Multiple Question: ans=AB 173253658...	A	B	C	D	AB	multiple	10
T/F Question: ans=T 1732536587018	---	---	---	---	T	true false	5
Short Question: ans=Short Question1...	---	---	---	---	Short Question	short	20
Multiple 1	Multiple 1	ABC	Multiple 3	DEF	AB	multiple	123
Short 1	---	---	---	---	Short Ans	short	343
True False	True	False	---	---	T	true false	345
Short 1	---	---	---	---	Short Ans	short	343342432

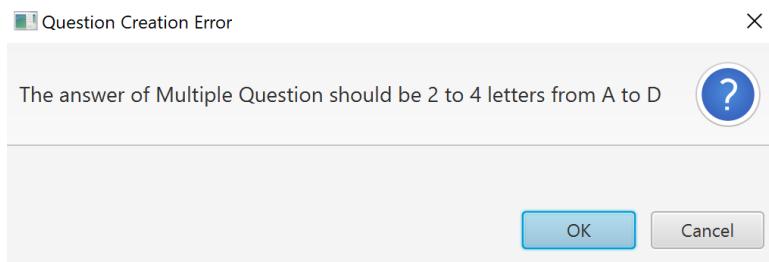
Output: Following error message prompted, question creation terminated



Invalid multiple answer: Input anything other than 2 to 4 letters from A to D in answer field with type selected as multiple and click “Add”

The screenshot shows a window titled "Question Management Bank". At the top, there are search and filter fields: "Question" (empty), "Type" (set to "all"), "Score" (empty), "Reset", and "Filter". Below this is a table with columns: Question, Option A, Option B, Option C, Option D, Answer, Type, and Time. The table contains several rows of question data. On the right side of the window, there is a detailed view for a selected question. This view includes fields for "Question" (empty), "Option A" (A), "Option B" (B), "Option C" (C), "Option D" (Aer), "Answer" (trr), "Type" (multiple), and "Score" (43). Buttons at the bottom include "Refresh", "Delete", "Update", and "Add".

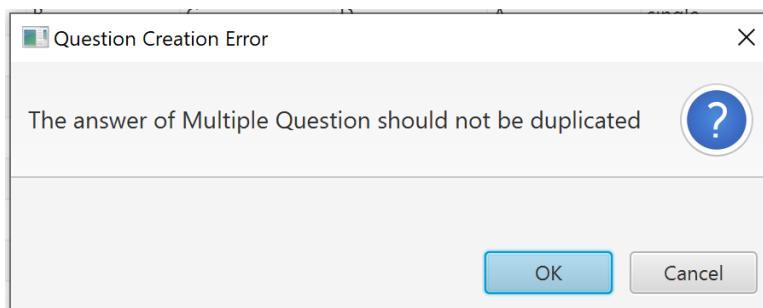
Output: Following error message prompted, question creation terminated



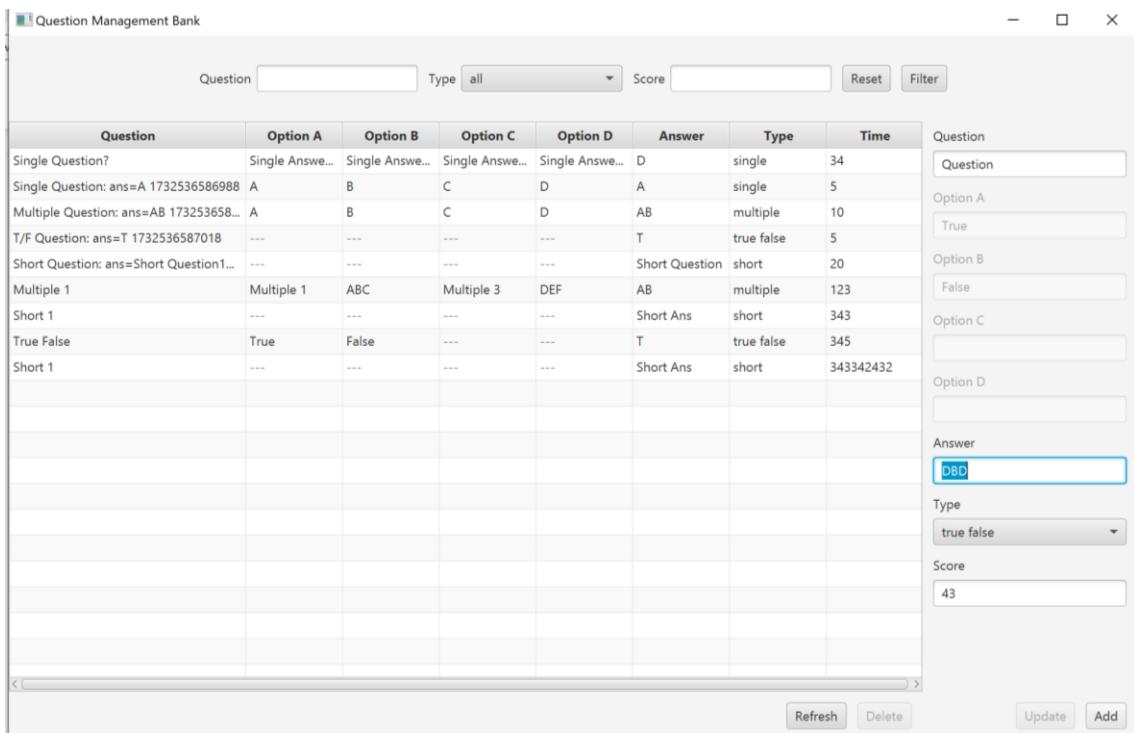
Duplicated answer in multiple question: Input 2 to 4 duplicated letters from A to D in answer field with type selected as multiple and click “Add”

The screenshot shows a Windows application window titled "Question Management Bank". On the left, there is a table with columns: Question, Option A, Option B, Option C, Option D, Answer, Type, and Time. The table contains several rows of question data. On the right, there is a sidebar with fields for entering new question details: Question (text input), Option A (text input with value "A"), Option B (text input with value "B"), Option C (text input with value "C"), Option D (text input with value "Aer"), Answer (text input with value "DBD"), Type (dropdown menu set to "multiple"), and Score (text input with value "43"). At the bottom of the sidebar are buttons for Refresh, Delete, Update, and Add.

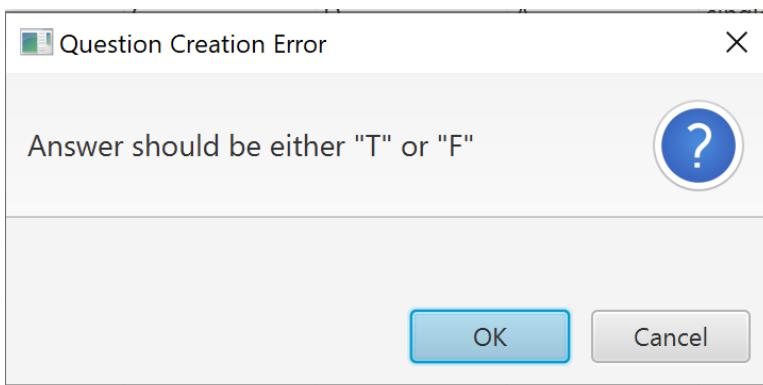
Output: Following error message prompted, question creation terminated



Invalid true false answer: Input anything other than a single “T” or “F” letter in answer field with type true false selected and click “Add”



Output: Following error message prompted, question creation terminated



Question Update

Normal question update: Select a question from the table, the information automatically fills in the form and “Update” button enabled. Change the fields accordingly and click update.

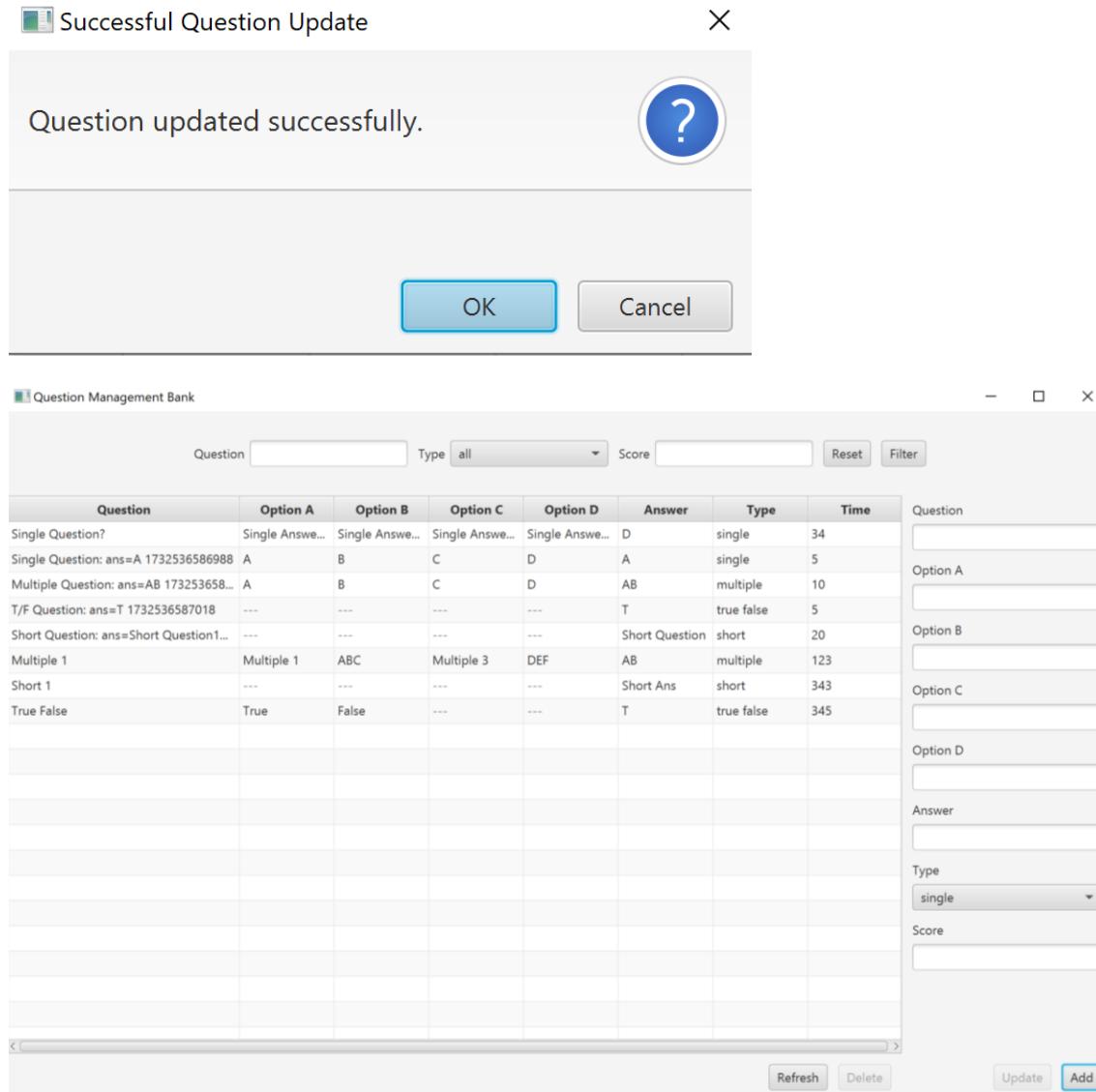
Question Management Bank

Question	Option A	Option B	Option C	Option D	Answer	Type	Time
Single Question?	Single Answe...	Single Answe...	Single Answe...	Single Answe...	D	single	34
Single Question: ans=A 1732536586988	A	B	C	D	A	single	5
Multiple Question: ans=AB 173253658...	A	B	C	D	AB	multiple	10
T/F Question: ans=T 1732536587018	---	---	---	---	T	true false	5
Short Question: ans=Short Question1...	---	---	---	---	Short Question	short	20
Multiple 1	Multiple 1	Multiple 2	Multiple 3	Multiple 4	AB	multiple	50
Short 1	---	---	---	---	Short Ans	short	343
True False	True	False	---	---	T	true false	345

Question
Multiple 1
Option A
Multiple 1
Option B
ABC
Option C
Multiple 3
Option D
DEF
Answer
AB
Type
multiple
Score
123

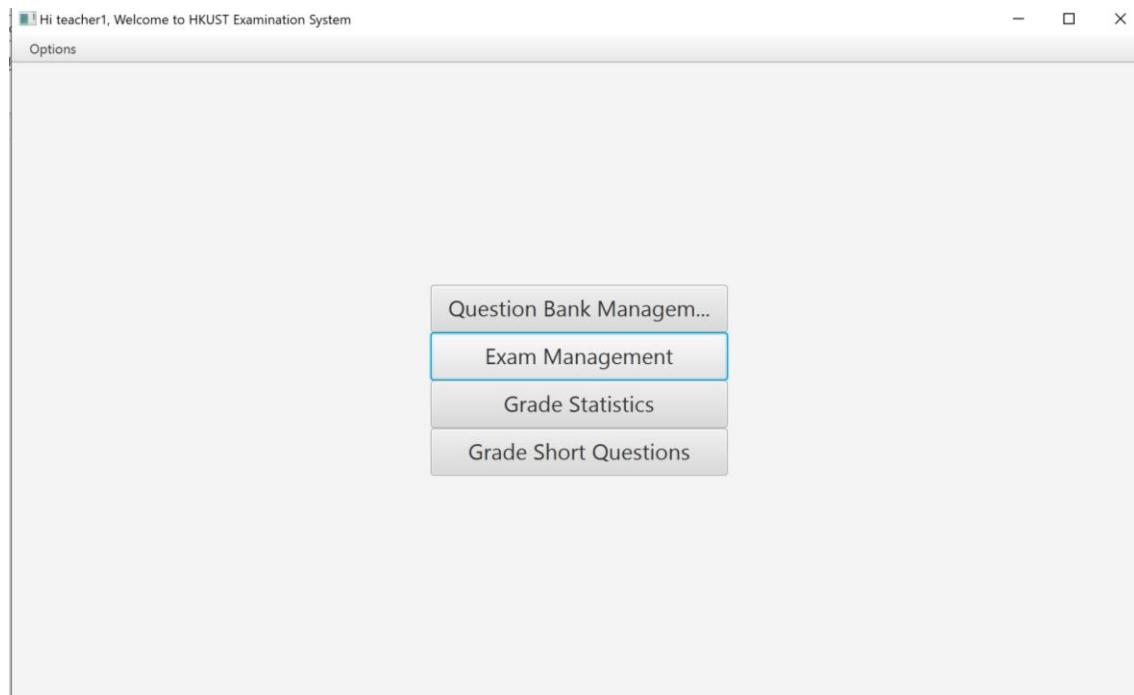
Refresh Delete Update Add

Output: Successful update message prompted, table refreshed, all rows deselected, form cleared (Other question type update and possible error are the same as question creation)



Exam Management Table

Start page: Click “Exam Management” Button in Teacher Main Page



Output: Start Exam Management Page and load all exam and question data from database and shown in the exam table (left) and question table (right) respectively

A screenshot of the "Exam Management" page. The page is divided into three main sections: "Exam Bank", "Question in Exam", and "Question Bank".

Exam Bank: A table with columns: Exam Name, Course ID, Exam Time, Published. Data rows include:

Exam Name	Course ID	Exam Time	Published
Exam 0	COMP2313	10	yes
Exam 1	COMP3111	11	no
Exam 2	COMP2711	12	yes
Exam 3	COMP2313	13	no

Question in Exam: A table with columns: Question, Type, Score. It displays the message "No question selected.".

Question	Type	Score
No question selected.		

Question Bank: A table with columns: Question, Type, Score. Data rows include:

Question	Type	Score
Single Question?	single	34
Single Question: a...	single	5
Multiple Question: ...	multiple	10
T/F Question: ans=...	true false	5
Short Question: an...	short	20
Multiple 1	multiple	123
Short 1	short	343
True False	true false	345

At the bottom of the page, there are several input fields and buttons:

- Buttons: Refresh, Delete.
- Input fields: Exam Name, Exam Time, Course ID (set to COMP2313), Publish (set to yes).
- Buttons: Delete All From Left, Add All To Left, Delete From Left, Add To Left, Update, Add.

Exam selection: Select an exam from exam table

Output: “Delete” and “Update” button enabled, automatically fills in the exam form and select associated question from question table (right) to the table showing questions in the exam (middle)

The screenshot shows a software application window titled "Exam Management". It contains three main sections: "Exam Bank", "Question in Exam", and "Question Bank".

Exam Bank: A table with columns: Exam Name, Course ID, Exam Time, Published. Data rows include: Exam 0 (COMP2313, 10, yes), Exam 1 (COMP3111, 11, no), Exam 2 (COMP2711, 12, yes), and Exam 3 (COMP2313, 13, no). The row for Exam 2 is highlighted.

Question in Exam: A table with columns: Question, Type, Score. Data rows include: Single Question? (single, 34), Multiple Question: ... (multiple, 10), T/F Question: ans=... (true false, 5), Short Question: an... (short, 20), Multiple 1 (multiple, 123), Short 1 (short, 343), and True False (true false, 345).

Question Bank: A table with columns: Question, Type, Score. Data rows include: Single Question: a... (single, 5), Multiple Question: ... (multiple, 10), T/F Question: ans=... (true false, 5), Short Question: an... (short, 20), Multiple 1 (multiple, 123), Short 1 (short, 343), and True False (true false, 345).

Bottom Control Panel: Includes buttons for Refresh, Delete, Update, Add, and navigation arrows between the three tables.

Exam Filtering

Normal exam filtering: Input valid exam filter and click “Filter”

Exam Name	Course ID	Exam Time	Published	Question	Type	Score	Question	Type	Score
Exam 0	COMP2313	10	yes	Single Question?	single	34	Single Question: a...	single	5
Exam 1	COMP3111	11	no				Multiple Question: ...	multiple	10
Exam 2	COMP2711	12	yes				T/F Question: ans=...	true false	5
Exam 3	COMP2313	13	no				Short Question: an...	short	20

Output: Exam table filtered based on the filter input (Blank field will not be considered in filtering)

Exam Name	Course ID	Exam Time	Published	Question	Type	Score	Question	Type	Score
Exam 0	COMP2313	10	yes				Single Question?	single	34

Question Filtering

Normal question filtering: Input valid question filter and click “Filter”

The screenshot shows the Exam Management application interface. On the left is the 'Exam Bank' panel with fields for Exam Name (Exam), Course ID (COMP2313), Published (yes), and buttons for Reset and Filter. In the center is the 'Question in Exam' panel, which displays a table with columns: Exam Name, Course ID, Exam Time, Published, Question, Type, and Score. A message 'No question selected.' is shown. On the right is the 'Question Bank' panel, also with fields for Exam Name, Course ID, Published, and buttons for Reset and Filter. This panel contains a table with columns: Question, Type, and Score. A specific row is highlighted: 'Single Question?' with 'single' in the Type column and '34' in the Score column. The 'Filter' button in the Question Bank panel is highlighted with a blue border.

Output: Question table filtered based on the filter input (Blank field will not be considered in filtering)

This screenshot shows the same Exam Management application after applying the filter. The 'Question Bank' panel now displays a single row in its table, corresponding to the filter criteria: 'single' for Type and '34' for Score. The 'Filter' button is no longer highlighted. The other panels (Exam Bank and Question in Exam) remain unchanged from the previous screenshot.

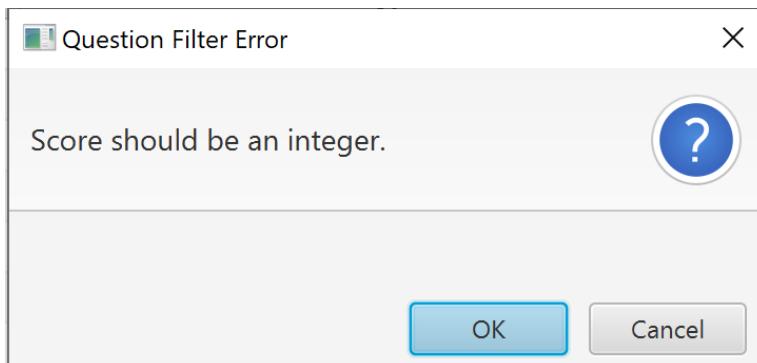
Non-integer score input: Input a non-integer into score field and click “Filter”

The screenshot shows the 'Exam Management' application interface. It consists of three main panels:

- Exam Bank:** Contains fields for 'Exam Name' and 'Course ID' (set to 'all'), and dropdowns for 'Published' (set to 'all') and 'Type' (set to 'all'). Buttons for 'Reset' and 'Filter' are present.
- Question in Exam:** A grid table with columns: Exam Name, Course ID, Exam Time, Published, Question, Type, and Score. The data includes various exam entries and question types with their respective scores.
- Question Bank:** Contains fields for 'Question' and 'Score' (set to 'te'), and dropdowns for 'Type' (set to 'all') and 'Score' (set to 'te'). Buttons for 'Reset' and 'Filter' are present. A message 'No question record.' is displayed.

At the bottom, there are buttons for 'Delete All From Left', 'Add All To Left', 'Delete From Left', 'Add To Left', 'Refresh', 'Delete', 'Update', and 'Add'.

Output: Following error message prompted, question filtering terminated

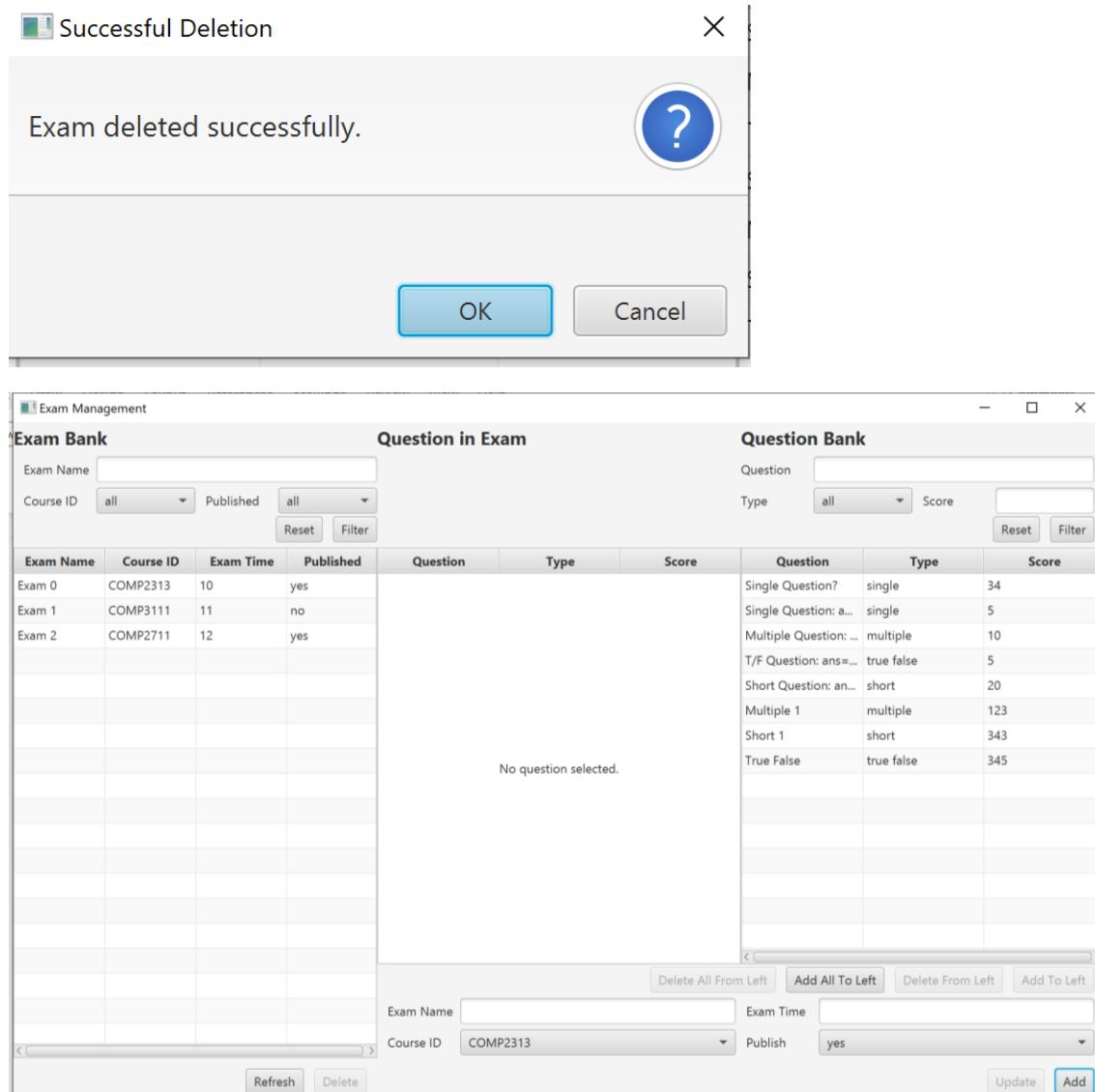


Exam Deletion

Normal exam deletion: Select an exam for deleting, the “Delete” button is enabled and click it.

Exam Bank				Question in Exam			Question Bank		
Exam Name				Question	Type	Score	Question		
Course ID	all	Published	all	Type	all	Score		Reset	Filter
Exam Name	Course ID	Exam Time	Published	Question	Type	Score	Question	Type	Score
Exam 0	COMP2313	10	yes	Single Question?	single	34	Single Question: a...	single	5
Exam 1	COMP3111	11	no				Multiple Question: ...	multiple	10
Exam 2	COMP2711	12	yes				T/F Question: ans=...	true false	5
Exam 3	COMP2313	13	no				Short Question: an...	short	20
							Multiple 1	multiple	123
							Short 1	short	343
							True False	true false	345

Output: Successful deletion message prompted, the selected exam deleted, exam table refreshed, exam form reset



Exam Creation

Normal exam creation: Input valid exam information and select questions for the exam. Selected questions will be removed from the question table and added to the table showing questions in exam (middle). Click “Add” after finished

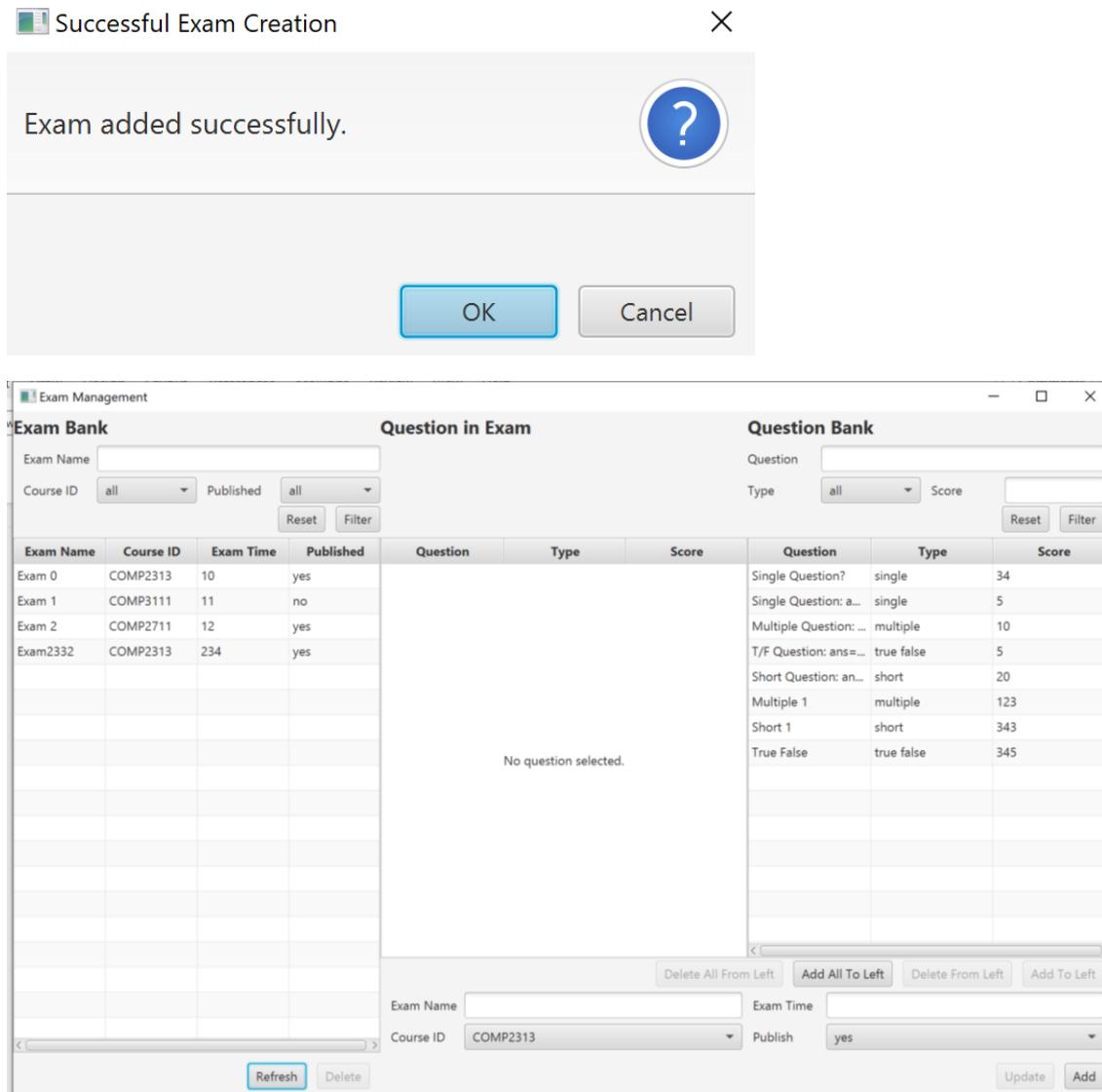
The screenshot shows a software interface for Exam Management. It consists of three main sections: Exam Bank, Question in Exam, and Question Bank.

Exam Bank: Contains filters for Exam Name, Course ID (set to 'all'), Published status (set to 'all'), and buttons for Reset and Filter. A table lists exams with columns: Exam Name, Course ID, Exam Time, Published, Question, Type, and Score. The table shows three rows: Exam 0 (COMP2313, 10, yes, Short 1, short, 343), Exam 1 (COMP3111, 11, no, True False, true false, 345), and Exam 2 (COMP2711, 12, yes, empty rows).

Question in Exam: This section is currently empty, indicated by a large gray area.

Question Bank: Contains filters for Question, Type (set to 'all'), and Score, along with buttons for Reset and Filter. A table lists questions with columns: Question, Type, and Score. The table shows several rows: Single Question? (single, 34), Single Question: a... (single, 5), Multiple Question: ... (multiple, 10), T/F Question: ans=... (true false, 5), Short Question: an... (short, 20), and Multiple 1 (multiple, 123). Below the tables are buttons for Delete All From Left, Add All To Left, Delete From Left, and Add To Left. At the bottom are input fields for Exam Name (Exam2332), Exam Time (234), Course ID (COMP2313), Publish (yes), and buttons for Refresh, Delete, Update, and Add.

Output: Successful exam creation message prompted, table refreshed, exam form reset, all rows deselected



No question selection: Input the exam form without selecting any question and click “Add”

The screenshot shows the 'Exam Management' application interface. It consists of three main panels:

- Exam Bank:** A table with columns: Exam Name, Course ID, Exam Time, Published. It contains four rows of data.
- Question in Exam:** A table with columns: Question, Type, Score. It displays the message "No question selected."
- Question Bank:** A table with columns: Question, Type, Score. It lists several question types with their respective scores.

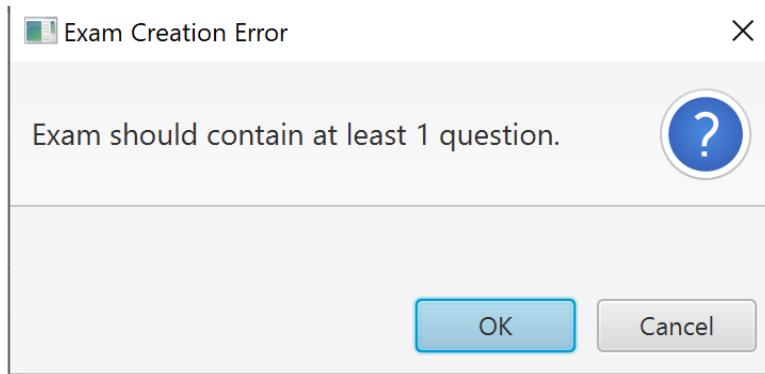
At the bottom, there are buttons for Refresh, Delete, and Add. The 'Add' button is highlighted in blue, indicating it was clicked.

Exam Name	Course ID	Exam Time	Published
Exam 0	COMP2313	10	yes
Exam 1	COMP3111	11	no
Exam2778	COMP2711	100	yes
Exam2332	COMP2313	234	yes

Question	Type	Score
No question selected.		

Question	Type	Score
Single Question?	single	34
Single Question: a...	single	5
Multiple Question: ...	multiple	10
T/F Question: ans=...	true false	5
Short Question: an...	short	20
Multiple 1	multiple	123
Short 1	short	343
True False	true false	345

Output: Following error message prompted, exam creation terminated



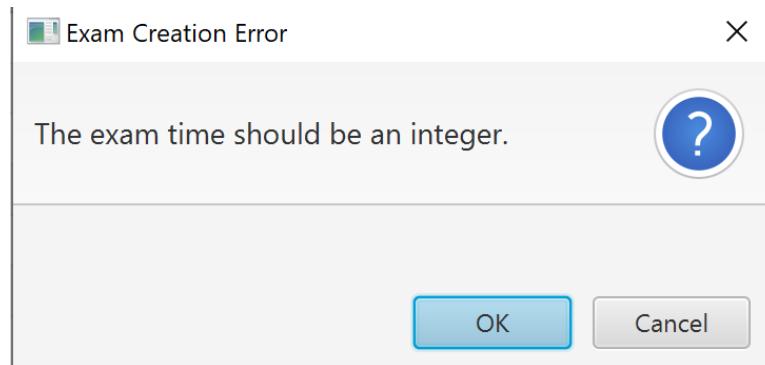
Non-integer exam time: Input exam time with non-integer input and click “Add”

The screenshot shows the 'Exam Management' application interface. It consists of three main panels:

- Exam Bank:** A table listing exams with columns: Exam Name, Course ID, Exam Time, Published, and a detailed view below. The detailed view shows rows for Exam 0, Exam 1, Exam2778, Exam2332, Exam898, and 545, each with their respective course IDs, exam times, and published status.
- Question in Exam:** A table showing the relationship between exams and questions. It has columns: Question, Type, and Score. Below this table is a message: "No question record."
- Question Bank:** A table listing questions with columns: Question, Type, and Score. Below this table is a message: "No question record."

At the bottom of the interface, there are several buttons: Refresh, Delete, Delete All From Left, Add All To Left, Delete From Left, Add To Left, Exam Name (set to 'Exam333'), Exam Time (set to 'gdff'), Course ID (set to 'COMP2313'), Publish (set to 'yes'), Update, and Add.

Output: Following error message prompted, exam creation terminated



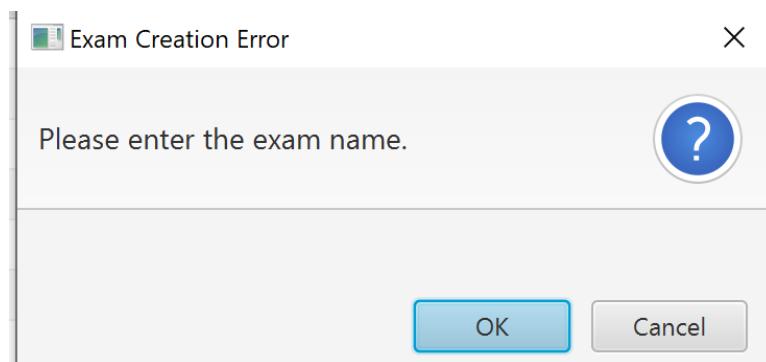
Blank input: Leaving any of the field blank in exam form and click “Add”

Sample: Leaving exam name field blank

The screenshot shows the Exam Management application interface. The main window has three tabs: Exam Bank, Question in Exam, and Question Bank. The Question in Exam tab is active, displaying a grid of questions with various types and scores. The Question Bank tab shows a list of questions. A modal dialog at the bottom is used for adding new exams, with fields for Exam Name, Course ID, Exam Time, and Publish status. The 'Add' button in this dialog is highlighted.

Output: Error message “Please enter the *field name*” prompted, exam creation terminated

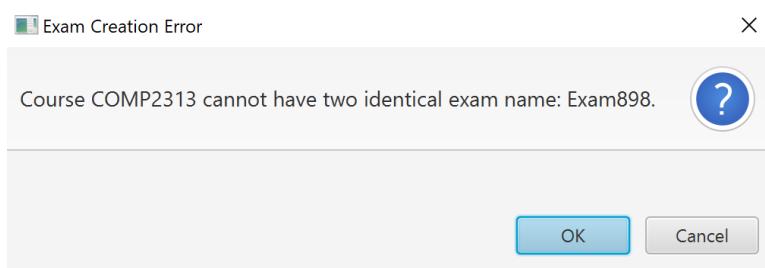
Sample output:



Duplicated exam creation: Input the exam name and course ID of an existing exam and click “Add”

The screenshot shows the 'Exam Management' application interface. On the left, the 'Exam Bank' panel displays a table of exams with columns: Exam Name, Course ID, Exam Time, and Published. An exam named 'Exam898' is selected, highlighted with a blue border. In the center, the 'Question in Exam' panel shows a table of questions with columns: Question, Type, Score, and a detailed view below. On the right, the 'Question Bank' panel shows a table of questions with columns: Question, Type, and Score. At the bottom, there are input fields for Exam Name (Exam898), Exam Time (1214453), Course ID (COMP2313), and Publish status (yes). Buttons for Refresh, Delete, Update, and Add are also present.

Output: Following error message prompted, exam creation terminated



Exam Update

Normal exam update: Select an exam and the exam form automatically filled in. Modify exam information and select questions for the exam. Selected questions will be removed from the question table and added to the table showing questions in exam (middle). Click “Update” after finished

The screenshot shows a software interface for managing exams. It has three main sections: Exam Bank, Question in Exam, and Question Bank.

Exam Bank: Contains a table with columns: Exam Name, Course ID, Exam Time, Published, Question, Type, and Score. The table shows four rows: Exam 0, Exam 1, Exam 2, and Exam2332.

Exam Name	Course ID	Exam Time	Published	Question	Type	Score
Exam 0	COMP2313	10	yes	Single Question?	single	34
Exam 1	COMP3111	11	no	Multiple 1	multiple	123
Exam 2	COMP2711	12	yes			
Exam2332	COMP2313	234	yes			

Question in Exam: This section is currently empty.

Question Bank: Contains a table with columns: Question, Type, and Score. The table shows several rows of questions with their types and scores.

Question	Type	Score
Single Question: a...	single	5
Multiple Question: ...	multiple	10
T/F Question: ans=...	true false	5
Short Question: an...	short	20
Short 1	short	343
True False	true false	345

Bottom Controls: Includes buttons for Refresh, Delete, Update, Add, and various selection dropdowns for Exam Name (Exam2778), Exam Time (100), Course ID (COMP2711), and Publish (yes).

Output: Successful exam update message prompted, table refreshed, exam form reset, all rows deselected (other related error related to exam form input are the same as in exam creation)

