

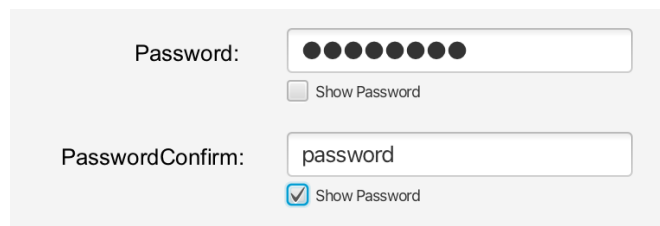
Supplementary Documents for HKUST Examination System
Group 20 - Curtis, Marco, Calvin

Design Assumptions:

1. A student can have multiple accounts
(As we don't require unique credentials from students e.g. SID, our system cannot distinguish the real identity of the student, which in turn allows the same student to have different accounts.)
2. A student / teacher will not change their credentials by themselves, they can only seek help from manager
3. A question can be of zero points
4. An exam should have at least one question.
5. A published exam cannot be changed and each student can only take the same exam once.
6. Exam time is in Second.
7. Once the exam is started, the time starts and cannot be paused.
8. A student cannot continue the exam after closing the exam window
9. The correct answer of the exam will not be shown.
10. Manager credentials are non-changeable (username: *admin*, password: *calvin*).
11. Assumed departments are represented as the [HKUST course code standard](#).

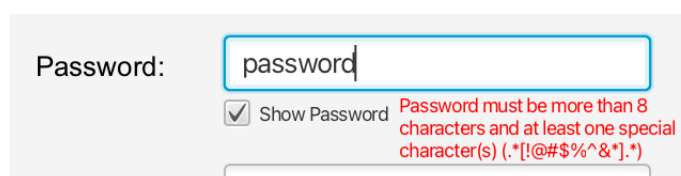
Features different from / beyond requirements and justification:

1. Hide and View Password Button
Referenced from the standard registration and login-in form, we decided to add a button to toggle viewing the password.



The screenshot shows a form with two password fields. The first field is labeled 'Password:' and contains ten black dots. Below it is a checkbox labeled 'Show Password' which is currently unchecked. The second field is labeled 'PasswordConfirm:' and contains the text 'password'. Below it is a checkbox labeled 'Show Password' which is checked.

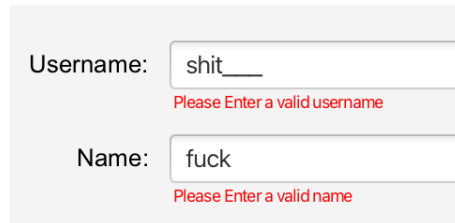
2. Password Security
We reinforced basic password security rules in every user account to ensure the security of the software



The screenshot shows a password field labeled 'Password:' containing the text 'password'. Below the field is a checked checkbox labeled 'Show Password'. To the right of the checkbox, a red error message is displayed: 'Password must be more than 8 characters and at least one special character(s) (.!@#\$\$%^&*].*)'.

3. NSFW Checking

We implement foul language checking of username and name to ensure they are safe for the workplace.

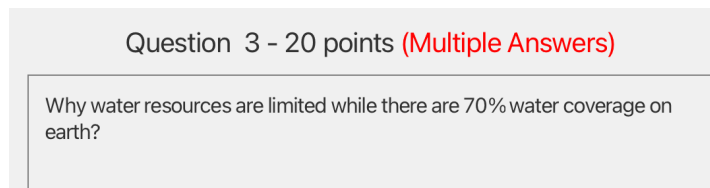


Username:
Please Enter a valid username

Name:
Please Enter a valid name

4. Multiple Answering Question Warning

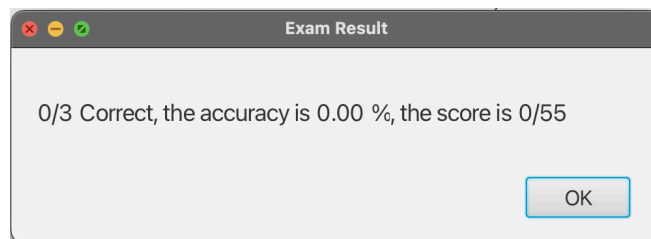
For questions requiring multiple answers, we added a label to the question to remind students; And to be distinguishable, students can only choose *one option* for single answering questions, no limit for multiple answering questions



Question 3 - 20 points (Multiple Answers)

Why water resources are limited while there are 70% water coverage on earth?

5. Exam result metrics changed from Precision to Accuracy



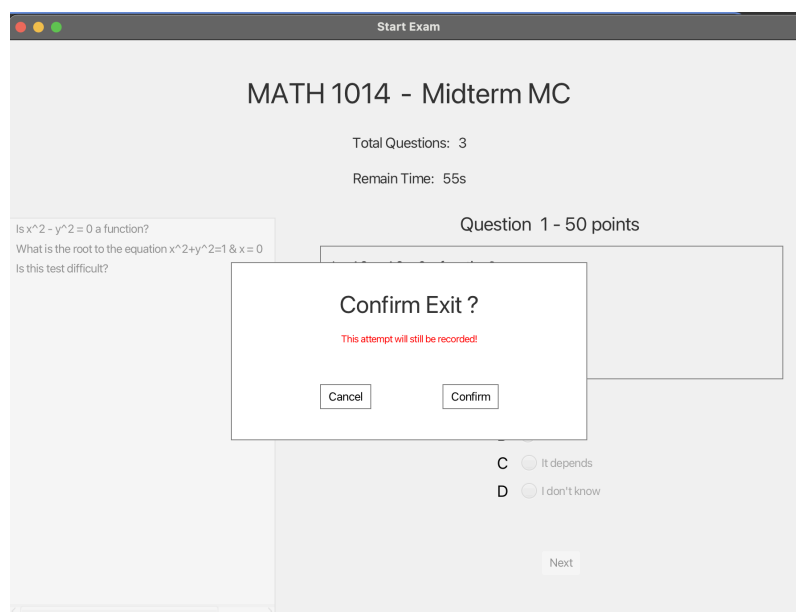
Exam Result

0/3 Correct, the accuracy is 0.00 %, the score is 0/55

OK

6. Accidental Exist Warning

We model the possibility of accidentally closing the exam window, so we provided a pop-up warning to make sure the student wants to quit the exam early. The answers *will still be recorded* no matter whether he/she submitted or not.



Start Exam

MATH 1014 - Midterm MC

Total Questions: 3

Remain Time: 55s

Question 1 - 50 points

Is $x^2 - y^2 = 0$ a function?

What is the root to the equation $x^2 + y^2 = 1$ & $x = 0$?

Is this test difficult?

Confirm Exit ?

This attempt will still be recorded!

Cancel Confirm

C ☐ It depends

D ☐ I don't know

Next

7. Redesigned UI for Question Bank Management

The sample design has a large table showing all questions but a small question editing area.

We want to emphasize the editing area to make user input more intuitive. We also want to accelerate the input process.

1. The editing area is enlarged
2. The editing area is moved to the left side
3. A radio-button group is used for answer input
4. An additional “clear” button to clear the input field

Question Bank Management

Question: Type: Score:

Question	Option A	Option B	Option C	Option D	Answer	Type	Score
Which of the following is a programming language...	Apple	Banana	Orange	B	Single	10	
What does CPU stand for?	Computer Proc...	Central Processi...	Computer Progra...	Centralized Progr...	B	Single	10
Which of the following is a programming language...	Java	Excel	Photoshop	HTML	D	Single	10
What does RAM stand for in computing?	Random Access...	Read-Only Memory	Running Applicati...	Remote Access M...	A	Single	10
Which of the following is NOT a programming lan...	Java	Python	HTML	Photoshop	D	Single	10
What is the main function of a GPU?	Data Storage	Graphics Rendering	Network Connect...	Power Supply	B	Single	10
What does HTML stand for in web development?	Hypertext Mar...	High Tech Moder...	How to Make Lists	Home Tool Mana...	A	Single	10
Which component of a computer is often referred...	Hard Drive	CPU	Monitor	Keyboard	B	Single	10
Which of the following are object-oriented progr...	Java	Python	C	HTML	AB	Multiple	20
Which of the following are types of computer me...	RAM	ROM	CPU	HDD	AB	Multiple	20
Which of the following are essential components ...	Motherboard	Keyboard	Monitor	Mouse	ABC	Multiple	20
Which of the following are commonly used web b...	Google Chrome	Photoshop	Safari	Microsoft Word	AC	Multiple	20
Which of the following are programming paradig...	Imperative	Declarative	Procedural	Visual Studio	ABC	Multiple	20

Question:

Option A:

Option B:

Option C:

Option D:

Answer:

Type:

Score:

Question Bank Management

Question: Type: Score:

Question Editor

Question:

Type:

Option A:

Option B:

Option C:

Option D:

Answer: ☐ A ☐ B ☐ C ☐ D

Score:

Question	Type	Option A	Option B	Option C	Option D	Answer	Score
How to spell ja...	Single	J	ja	jav	java	[A]	10
How many cup...	Single	5	6	7	8	[D]	5
How much drin...	Single	118	76	94	I don't kn...	[D]	30
Why water res...	Multiple	Most wat...	Ocean w...	Water res...	Water res...	[B, C]	20
mRNA is creat...	Single	Transcrip...	Translato...	Transpos...	Transpos...	[C]	25
What does nat...	Multiple	Adaptive...	Genetic S...	Character...	Speciation	[A, C, D]	25
Which choice ...	Single	Cell Sten...	Deoxyrib...	Stem Cells	Gene Reg...	[A]	50
How are huma...	Single	Chimpan...	Chimpan...	Chimpan...	Chimpan...	[B]	0
1+1=	Single	0	1	2	3	[C]	10
1-1=	Single	0	1	2	3	[A]	10
1*1=	Single	0	1	2	3	[B]	10
1/1=	Single	0	1	2	3	[B]	10
Is this test dff...	Single	Easy!	Not too d...	Quite cha...	Can I eve...	[A]	0

8. Redesigned UI for Exam Management

The sample design didn't organize the 3 tables logically. The input area is subtle and small.

Again, we want to emphasize the editing area and tidy up the flow of input to make user input more intuitive.

1. The editing area is enlarged
2. The editing area is moved to the left side
3. The “Remove from left” and “Add to right” Buttons are redesigned and repositioned to make them more coherent to their corresponding table.
4. An additional “clear” button to clear the input field

Exam Management

Exam Name: Course ID: Course: Publish:

Exam Name	Course ID	Exam Time	Publish
quiz1	COMP3111	30	yes
quiz2	COMP3111	30	yes
quiz3	COMP3111	40	no
quiz4	COMP3111	30	yes
quiz5	COMP3111	30	yes
quiz6	COMP3111	60	no
quiz7	COMP3111	200	yes

Question in Exam

Question	Type	Score
Which of the follow...	Single	10
What does CPU stand...	Single	10
Which of the follow...	Single	10
What does RAM stan...	Single	10
Which of the follow...	Single	10
What is the main func...	Single	10
What does HTML stan...	Single	10
Which component of ...	Single	10
Which of the follow...	Multiple	20
Which of the follow...	Multiple	20
Which of the follow...	Multiple	20
Which of the follow...	Multiple	20
Which of the follow...	Multiple	20

Exam Question

Exam Question	Type	Score
How to spell java?	Single	10
How many cups of wa...	Single	5
How much drinking fou...	Single	30
Why water resources ar...	Multiple	20
mRNA is created in a cel...	Single	25
What does natural sele...	Multiple	25
Which choice below isn...	Single	50
How are human differen...	Single	0
1+1=	Single	10
1-1=	Single	10

Exam Name:

Exam Time:

Course ID: Course: Publish:

Exam Management

Exam Name: Course: Published:

Exam Manager

Exam Name:

Time Limit:

For Course:

Exam Name	Course ID	Exam Time	Published
Water Quiz	ENVR 1010	20	true
n-class quiz	LPS 3030	40	true
n-class activity	LPS 3030	30	true
Math level Preliminary Test	MATH 1013	12	true

Question: Type: Score:

Exam Question	Type	Score
How to spell java?	Single	10
How many cups of wa...	Single	5
How much drinking fou...	Single	30
Why water resources ar...	Multiple	20
mRNA is created in a cel...	Single	25
What does natural sele...	Multiple	25
Which choice below isn...	Single	50
How are human differen...	Single	0
1+1=	Single	10
1-1=	Single	10

>> Delete Question from Left << << Add Question to Left >>

Limitations

1. Student cannot review their answers after the exam
In this system, students can view grades after they take an exam, but cannot view which questions are wrong and which are correct.
The reason behind maybe is to prevent copying between students to embrace fairness.
2. Questions from the published exam cannot be changed
3. An exam attempt cannot be regarded.
4. User credentials are not security stored, e.g. no hashing is presented, maybe vulnerable to attacks.

System Architecture

1. Database was implemented in form of JSON files

Changes from Original Use-case Specification

1. Student registration sanity check warning

It was stated in the use-case specification that the entry text box will be enclosed by a red box when an input did not pass the validation. However, upon designing the UI, it was found that enclosing all entries with a red rectangle box reduces UX as it seems bulky. The representation is then changed to using red warning texts under the text field.