COMP 3111 Fall 2024 Project Plan

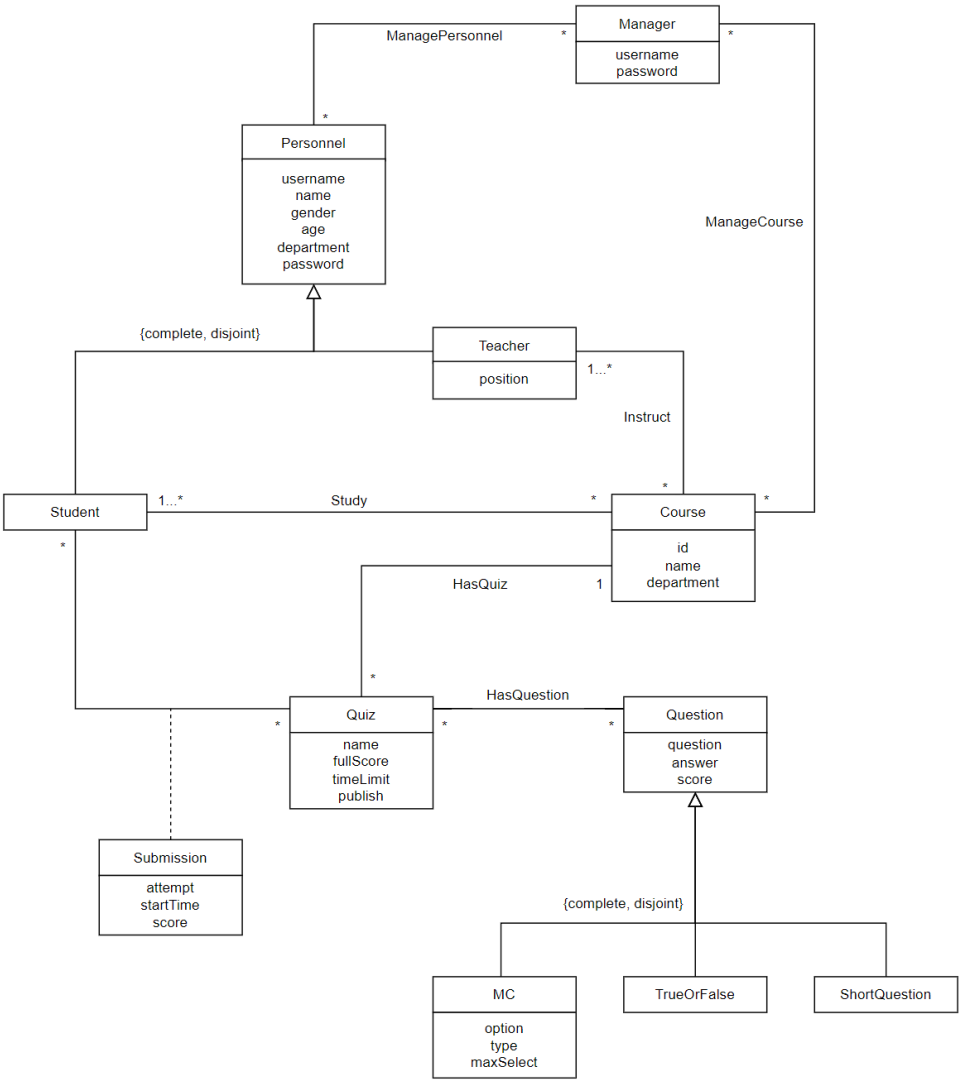
Team 28

October 23, 2024

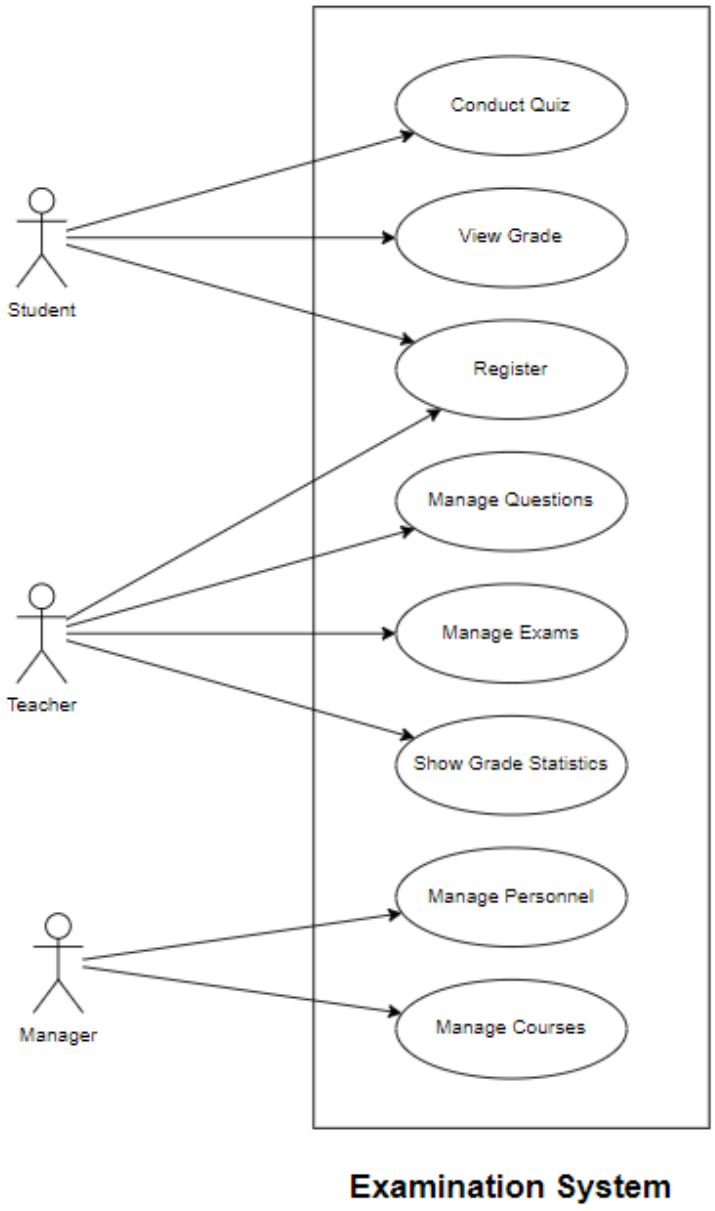
Task Allocation

Team Members	Class Diagram	Use-case Diagram	Task 1	Task 2	Task 3
LI Ching Ho	✓	✓	✓		
CHEUNG Tuen King	✓	✓		✓	
WAN Hanzhe	✓	✓			✓

Class Diagram



Use-case Diagram



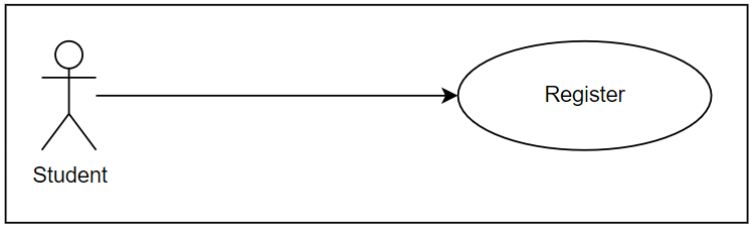
Task 1. Student Portal

Use Case: Registration

Brief Description

- Student will be redirected to Login screen if he presses the “Student Login” button in main menu
- In Login screen, if Student presses “Register” button, he will be redirected to the Register screen.
- Student should complete his registration here.
- The “Reset” button in the Register screen will clear all information entered.

Use-case Diagram



Basic Flow

1. Student should input all information (Username, Name, Gender, Age, Department, Password, PasswordConfirm) required.
2. If all input fields are filled and the values entered are valid,
   After pressing “Register” button, a Hint Dialog displaying “Register successful” message will pop up.
3. The new Student Information will be stored at the backend.
4. Student will be redirected back to Login screen.

Alternate Flows

- *A1. Invalid information provided for registration*

  At **{Register button clicked}**

  - If any input fields are left blank,
    Display error message “Error: input field name required. Please input a value in input field name field.”

  - If username inputted have already been occupied by another Student,
    Display error message “Error: Username occupied. Please input another username.”

  - If name inputted is found registered before,
    Display error message “Error: Student had already registered.”

  - If age inputted is not valid (e.g. non-numeric value, inputted age < 0),
    Display error message “Error: Age invalid. Please check your input in input field Age.”

  - o If department inputted is not valid (e.g. numeric value),
    Display error message “Error: Department invalid. Please check your input in input field Department.”

  - If inputted value in Password does not match the value in PasswordConfirm,
    Display error message “Error: Password not match. Please confirm your Password again.” and PasswordConfirm field will be cleared.

- *A2. Register screen closed*

  At **{Close button clicked}**

  - Student will be redirected back to the Login screen.

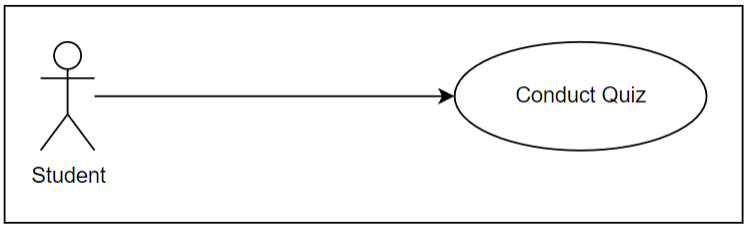
Use Case: Conduct Quiz

Brief Description

- After Student login to the system, he can conduct quiz at the Quiz Selection screen, by selecting the available quizzes.
- Only published quizzes from courses that Student is studying will be available for selection.
- Once a student selects a quiz and presses “Start”, he will be redirected to Question screen.
- The Question screen contains the following items:
  - Quiz name
  - Total number of questions in quiz
  - A timer for quiz (time in seconds)
  - Column listing all questions (on left side)
  - Question display (default question 1 when Student have just started the quiz)
    *details of this display will be described later in this document
  - Buttons
    * A Next button for answering next question
    * A Previous button for going back to previous question
    * A Submit button to submit the quiz
- Question display varies for different question types
  - For Single-selected Multiple-Choices Question, it contains:
    * The Question
    * All options, with a select button each
  - For True or False Question, it contains:
    * The Question
    * A True option and a false option, both with a select button
  - For multiple-selected Multiple-Choice Question, it contains:
    * The Question
    * All options, with a checkbox each
    * A Clear button to uncheck all checkboxes
  - For Short Question, it contains:

    * The Question
    * An answer input field
    * A Clear button to clear the answer input field

Use-case Diagram



Answer Save Flow

- At **Next button clicked**
    1. The answer to the current question will be saved.
    2. It will then move to display the next question.
- At **Questions at the question side column clicked**
    1. The answer to the current question will be saved.
    2. It will then move to display the question clicked by Student.
- For every move to another question, if there exists any answer saved to the destinated question, show that saved attempt. To be specific:
    - For Short Question, answer saved will be shown in the input field.
    - For single-selected Multiple-Choice or True or False Question, checked select button will remain checked, the remaining will remain unchecked.
    - For multiple-selected Multiple-Choice Question, checked checkboxes will remain checked, the unchecked ones will remain unchecked.

Quiz Submission Flow

- At **Submit button clicked**

  1. The Answer to the current question will be saved.
  2. A Hint Dialog will pop out showing the message “Please confirm that you want to submit your quiz. Once submitted, you cannot modify your answer anymore.”.
  3. Student can choose to press “Confirm” to proceed or “Cancel” to go back to the Question screen to modify his answer.
  4. After submission, a Result Dialog will pop up, displaying the result for this quiz.
  5. After pressing “OK” in the Result Dialog, Student will be redirected back to the Quiz Selection screen.

- At **Timer hits 0 seconds**, i.e. Time’s up!

  1. All answers in this quiz will be saved.
  2. A Time Up Dialog pops up to remind Student the exam time is over.
  3. After pressing "OK" in the Time Up Dialog, the Result Dialog will pop up, displaying the result for this quiz.
  4. After pressing “OK” in the Result Dialog, Student will be redirected back to the Quiz Selection screen.

Answer Attempt Handling Flow

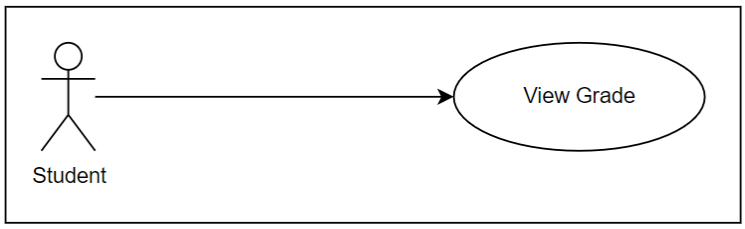
- For single-selected Multiple-Choice or True or False Question,
  - At the first attempt, selecting an option will make the select button of the corresponding option checked.
  - After the first attempt, if Student modify his answer, clicking other select buttons corresponding to other option will uncheck the checked select button for the previously chosen option.
- For multiple-selected Multiple-Choice or True or False Question,
  - Selecting an option will make the checkbox of the corresponding option checked.
  - If checkboxes (options) checked meets the maximum check limit, disable checking of the unchecked checkboxes (options) until Student unchecks one of the checked checkboxes (options) or presses “Clear” to uncheck all checked checkboxes (options).
- For Short Question,
  - Student can input and modify his answer in the answer input field.
  - If Student presses “Clear” button, the answer input field will be cleared.

Use Case: View Grade

Brief Description

- After Student login to the system, at the bottom of Question Selection Screen, Student can click the "Grade Statistics" button
- After clicking the button, the Grade Statistics Dialog will pop up.
- The Grade Statistics Dailog will contain the following elements:
  - A list of quiz taken, details including Score, Full Score, Time used
  - Course filter
  - A Reset button
  - A Filter button
  - Bar chart to show the statistics
  - A Refresh button
- Grades from all quizzes taken are displayed by default

Use-case Diagram



Basic Flow

1. If a Student clicks the Course filter, the list listing all courses that are being studied by the Student will expand.
2. If Student click any one of the course in the list and press "Filter",
   It will filter out and display only the grades from all quizzes in that courses. To be specific, the grade table will only include the grade from all quizzes in that courses, and the bar chart will display grades only from all quizzes in that course.
3. If Student click the "Reset" button,
   If the course filter contains any selected courses, it will clear all courses in the filter.
4. If Student click the "Refresh" button, it will refresh and the default Grade Statistics Dialog (no filter applied, all quizzes displayed) will be shown.

Alternate Flows

- *A1. No course selected in the filter* At **{Filter button clicked}**

    1. A Hint Dialog pops up displaying the message "There is no courses selected in the filter.".

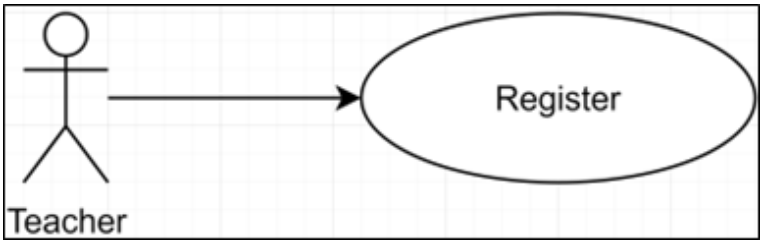
    2. Student can then press the "OK" button in the Hint Dialog and return back to the Grade Statistics Dialog.

Task 2. Teacher Portal

Use Case: Register

Brief Description
This use case describes how a teacher registers a new account in the HKUST examination system.

Use-case Diagram



Basic Flow

1. The use case starts when the Teacher actor chooses to register a new account.
2. the Teacher clicks the “Teacher Login” button at the starting interface.
3. The system displays the login interface.
4. The Teacher clicks the “Register” button
5. The system displays the interface for registration.

   {Enter Registration Form}
6. The Teacher enters the registration form.

   {Click "Register" Button}
7. The Teacher clicks the “Register” button.
8. The system stores the entered registration information into the backend.
9. The system prompts the “Registered successfully” message.
10. The system goes back to the login interface.
11. The use case ends.

Alternate Flows

- *A1: Registration Termination*

  At **{Enter Registration Form}** if the Teacher clicks the “Close” button,

  1. The system goes back to the login interface.
  2. The use case ends with no new registration information stored in the backend.

- *A2: Empty Text Field*

  At **{Click “Register” Button}** if any text field in the registration form is empty,

  1. The system prompts the “Please make sure all fields are filled in” message.
  2. The flow of events is resumed at **{Enter Registration Form}**.

- *A3: Repeated Username*

  At **{Click “Register” Button}** if the entered username exists at the backend,

  1. The system prompts the “Username repeated” message.
  2. The flow of events is resumed at **{Enter Registration Form}**.

- *A4: Unconfirmed Password*

  At **{Click “Register” Button}** if the entered password and confirmed password are different,

  1. The system prompts the “Password and Confirmed Password are different” message.
  2. The flow of events is resumed at **{Enter Registration Form}**.

- *A5: Not Selected Position*

  At **{Click “Register” Button}** if the position is not selected,

  1. The system prompts the “Please select a position” message.
  2. The flow of events is resumed at **{Enter Registration Form}**.

- *A6: Not Selected Gender*

  At **{Click "Register" Button}** if the gender is not selected,

  1. The system prompts the "Please select a gender" message.
  2. The flow of events is resumed at **{Enter Registration Form}**.

- *A7: Invalid Age*

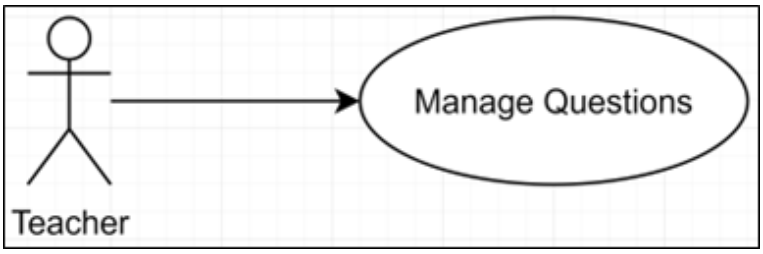
  At **{Click "Register" Button}** if the entered age is not a number, negative, zero or exceeds 100,

  1. The system prompts the "Please enter a valid age in range 1 to 100" message.
  2. The flow of events is resumed at **{Enter Registration Form}**.

Use Case: Manage Questions

Brief Description
This use case describes how a teacher manages, reads, filters, creates, updates and deletes the questions in the HKUST examination system.

Use-case Diagram



Basic Flow

1. The use case starts when the Teacher actor chooses to manage the question bank.
2. The Teacher clicks the “Question Bank Management” button.
3. The system displays a question bank management interface.
4. The system loads all questions from the backend to the question bank.
5. While the Teacher chooses to manage the question bank,
    5.1 If the Teacher chooses to add or update a question,
        5.1.1 Performs sub-flow *Create or Update a Question*.
    5.2 If the Teacher chooses to delete a question,
        5.2.1 Performs sub-flow *Delete a Question*.
    5.3 If the Teacher chooses to filter the questions,
        5.3.1 Performs sub-flow *Filter the Questions*.
    5.4 If the Teacher chooses to refresh the question bank,
        5.4.1 The Teacher clicks the “Refresh” button.
        5.4.2 The system refreshed the question bank.
6. The use case ends.

Sub-flows

- *S1: Create or Update a Question*

1. If the Teacher chooses to add a new question based on the existing question or update a question,

   {Select Creating or Updating Question}

   1.1 Perform sub-flow *Select a Question*.

2. Else,

   2.1 The Teacher selects a question type for the new question.

   2.2 Perform sub-flow *Set up Question Input Form*.

   {Enter Question Input Form}

3. The Teacher enters the question information.

4. If the Teacher chooses to add a question,

   {Confirm Creating Question}

   4.1 The Teacher clicks the “Add” button.

   4.2 The system adds the entered question information into the backend.

   4.3 The system prompts the “Add Successfully” message.

5. Else,

   {Confirm Updating Question}

   5.1 The Teacher clicks the “Update” button.

   5.2 The system updates the entered question information at the backend.

   5.3 The system prompts the “Update Successfully” message.

6. Perform sub-flow *Reset Question Input Form*.

- *S2: Delete a Question*

  {Select Deleting Question}

  1. Perform sub-flow *Select a Question*.

  {Confirm Deleting Question}

  2. The Teacher clicks the “Delete” button.
  3. The system deletes the selected question at the backend.
  4. The system prompts the “Delete Successfully” message.
  5. Performs sub-flow *Reset Question Form Input*.

- *S3: Filter the Questions*

  {Enter Filters}

  1. The Teacher enters the question, question type and score for filtering.

  {Confirm Filters}

  2. The Teacher clicks the “Filter” button.
  3. The system filters and refreshes the question bank.

- *S4: Select a Question*

  1. The Teacher selects a question from question bank.
  2. The system auto-fills the question input form based on the selected question.
  3. Perform sub-flow *Set up Question Input Form*.

- *S5: Set up Question Input Form*
    1. If no question type is selected, or question type “Single” or “Multiple” is selected,
        1.1 The system enables all fields in the question input form.
    2. If question type “Short Question” is selected,
        2.1 The system disables all option fields.
        2.2 The system enables all other fields.
    3. If question type “True/ False” is selected,
        3.1 The system disables all option fields.
        3.2 The system auto-fills the first 2 options as “T” and “F”.
        3.3 The system enables all other fields.
- *S6: Reset Question Form Input*
    1. The system refreshes the question bank.
    2. The system resets the question input form.

Alternative Flows

- *A1: Reset Question Filter*

  At **{Enter Filters}** if the Teacher chooses to reset the filters,

  1. The Teacher clicks the “Reset” button.
  2. The system empties the question and score filters.
  3. The system resets the question type filter to “Type”.
  4. The flow of events is resumed at **{Enter Filters}**.

- *A2: Invalid Score in Question Filter*

  At **{Confirm Filters}** if the entered score is non-numeric, negative or zero,

  1. The system prompts “Invalid Score Filter” message.
  2. The flow of events is resumed at **{Enter Filters}**.

- *A3: Empty or Unselected Fields in Question Input Form*

  At **{Confirm Creating Question}** or **{Confirm Updating Question}** if there exist empty field(s) that is enabled in the question input form,

  1. The system prompts “Please fill in and selects all enabled fields” message.
  2. The flow of events is resumed at **{Enter Question Input Form}**.

- *A4: : Invalid Score in Question Input Form*

  At **{Confirm Creating Question}** or **{Confirm Updating Question}** if the entered score is non-numeric, negative or zero,

  1. The system prompts “Invalid Score for Question” message.
  2. The flow of events is resumed at **{Enter Question Input Form}**.

- *A5: : Invalid Answer in Question Input Form*

  At **{Confirm Creating Question}** or **{Confirm Updating Question}** if the entered answer is invalid,

  1. 1. If the question type is “Single” and the answer is not a letter from “A” to “D”,

     1.1 The system prompts “The answer for question type ‘Single’ should be a letter from ‘A’ to ‘D’” message.

  2. If the question type is “Multiple” and the answer is not 2 to 4 unique letters from “A” to “D”,

     2.1 The system prompts “The answer for question type ‘Multiple’ should be 2 to 4 unique letters from ‘A’ to ‘D’” message.

  3. If the question type is “Multiple” and the answer contains duplicated letters from “A” to “D”,

     3.1 The system prompts “The answer for question type ‘Multiple’ should not be duplicated” message.

  4. If the question type is “True/ False” and the answer is not a letter of “T” or “F”,

     4.1 The system prompts “The answer for question type ‘True/ False’ should be a letter of ‘T’ or ‘F’” message.

  5. If the question type is “Short Question” and the answer exceeds the length of 14,

     5.1 The system prompts “The length of answer for question type ‘Short Question’ should be in range 1 to 14” message.

  6. The flow of events is resumed at **{Enter Question Input Form}**.

- *A6: No Question Selected for Deleting*

  At **{Confirm Deleting Question}** if no question is selected,

  1. The system prompts “Please select a question for deleting” message.

  2. The flow of events is resumed at **{Select Deleting Question}**.

- *A7: No Question Selected for Updating*

  At **{Confirm Updating Question}** if no question is selected,

  1. The system prompts “Please select a question for updating” message.
  2. The flow of events is resumed at **{Select Creating or Updating Question}**.

- *A8: Excessive Score for a Question*

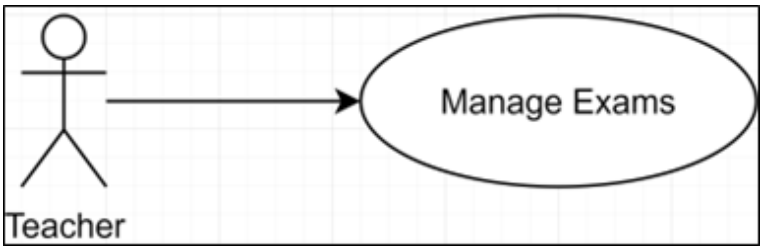
  At **{Confirm Updating Question}** or **{Confirm Creating Question}** if the entered score exceeds 100,

  1. The system prompts “Please enter an appropriate score in range 1 and 100” message.
  2. 4. The flow of events is resumed at **{Enter Question Input Form}**.

Use Case: Manage Exams

Brief Description
This use case describes how a teacher manages, reads, filters, creates, updates and deletes the exams in the HKUST examination system.

Use-case Diagram



Basic Flow

1. The use case starts when the Teacher actor chooses to manage the exam in the system.
2. The Teacher clicks the “Exam Management” button.
3. The system shows the exam management interface.
4. The system loads all exams and questions into the tables.
5. The system loads all course ID options to the course ID drop-down list.
6. While the Teacher chooses to manage the exam,
   - 6.1 If the Teacher chooses to add or update an exam,
     - 6.1.1 Performs sub-flow *Create or Update an Exam*.
   - 6.2 If the Teacher chooses to delete an exam,
     - 6.2.1 Performs sub-flow *Delete an Exam*.
   - 6.3 If the Teacher chooses to filter the exam,
     - 6.3.1 Performs sub-flow *Filter the Exams*.
   - 6.4 If the Teacher chooses to filter the questions,
     - 6.4.1 Performs sub-flow *Filter the Questions*.
   - 6.5 If the Teacher chooses to refresh the exam and/ or question tables,
     - 6.5.1 The Teacher clicks “Refresh” button.
     - 6.5.2 The system refreshes the exam and question tables.
7. The use case ends.

Sub-flows

- *S1: Create or Update an Exam*

1. If the Teacher chooses to add an exam based on existing exam or update an exam,

   {Select Updating or Creating Exam}

   1.1 Performs sub-flow *Select an Exam*.

   {Enter Exam Form Input}

2. The Teacher enters the exam information.

   {Select Questions}

3. While the Teacher chooses to manage the questions in the exam,

   3.1 Performs sub-flow *Manage Question in Exam*.

4. If the Teacher chooses to add an exam,

   {Confirm Creating Exam}

   4.1 The Teacher clicks the “Add” button.

   4.2 The system adds the created exam into the backend.

   4.3 The system prompts “Add Successfully” message.

5. Else,

   {Confirm Updating Exam}

   5.1 The Teacher clicks the “Update” button.

   5.2 The system updates the exam into the backend.

   5.3 The system prompts “Update Successfully” message.

6. Performs sub-flow *Reset Exam Input Form*.

- *S2: Delete an Exam*

  {Select Deleting Exam}

  1. Performs sub-flow *Select an Exam*.

  {Confirm Deleting Exam}

  2. The Teacher clicks the “Delete” button.
  3. The system deletes the selected exam in the backend.
  4. The system prompts the “Delete Successfully” message.
  5. Performs sub-flow *Reset Exam Input Form*.

- *S3: Filter the Exams*

  {Enter Exam Filters}

  1. The Teacher enters the exam name, course ID and/ or publish filters.
  2. The Teacher clicks the “Filter” button next to the exam filters.
  3. The system filters and refreshes the exam table based on the filters.

- *S4: Filter the Questions*

  {Enter Question Filters}

  1. The Teacher enters the question, question type and/ or score filters.

  {Confirm Question Filters}

  2. The Teacher clicks the “Filter” button next to the question filters.
  3. The system filters and refreshes the question table based on the filters.

- *S5: Select an Exam*

  1. The Teacher selects an exam from the exam table.
  2. The system auto-fills the exam input form based on the selected exam.
  3. The system adds questions in exam to the table showing questions in exam and deletes them from the question table.

- *S6: Reset Exam Input Form*
    1. The system refreshes the exam table.
    2. The system resets the exam input form.
    3. The system clears the table showing the questions in exam.
    4. The system re-lists all questions in the question table based on the filters.
- *S7: Manage Questions in Exam*
    1. If the Teacher chooses to add question(s) to the exam,
        1.1 The Teacher selects question(s) from the question table.
        1.2 The Teacher clicks “Add to left” button.
        1.3 The system adds the selected question(s) to the table showing the questions in exam.
        1.4 The system deletes the selected question(s) from the question tables.
    2. If the Teacher chooses to delete question(s) from the exam,
        2.1 The Teacher selects question(s) from the table showing the questions in exam.
        2.2 The Teacher clicks “Delete from left” button.
        2.3 The system deletes the selected question(s) from the table showing the question in exam.
        2.4 The system adds the selected question(s) to the question table.

Alternative Flows

- *A1: Reset Filters in Question Filter*

  At **{Enter Question Filters}** if the Teacher chooses to reset the filters,

  1. The Teacher clicks the “Reset” button next to the question filters.
  2. The system resets the filters.
  3. The flow of events is resumed at **{Enter Question Filters}**.

- *A2: Reset Filters in Exam Filter*

  At **{Enter Exam Filters}** if the Teacher chooses to reset the filters,

  1. The Teacher clicks the “Reset” button next to the exam filters.
  2. The system resets the filters.
  3. The flow of events is resumed at **{Enter Exam Filters}**.

- *A3: Invalid Score in Question Filter*

  At **{Confirm Question Filters}** if the entered score is non-numeric, negative or zero,

  1. The system prompts “Invalid Score Filter” message.
  2. The flow of events is resumed at **{Enter Question Filters}**.

- *A4: No Exam Selected for Deleting*

  At **{Confirm Deleting Exam}** if no exam is selected,

  1. The system prompts “Please select an exam for deleting” message.
  2. The flow of events is resumed at **{Select Deleting Exam}**.

- *A5: No Exam Selected for Updating*

  At **{Confirm Updating Exam}** if no exam is selected,

  1. The system prompts “Please select an exam for updating” message.
  2. The flow of events is resumed at **{Select Creating or Updating Exam}**.

- *A6: Empty or Unselected Field in Exam Input Form*

  At **{Confirm Updating Exam}** or **{Confirm Creating Exam}** if exam name or exam time is empty, or course ID or published is not selected,

  1. The system prompts “Please make sure all fields are filled in or selected” message.
  2. The flow of events is resumed at **{Enter Exam Input Form}**.

- *A7: Two Identical Exam Names in One Course*

  At **{Confirm Updating Exam}** or **{Confirm Creating Exam}** if there exist an exam in the backend with the same exam name entered and course ID selected,

  1. The system prompts “A course should not have two same exam names” message.
  2. The flow of events is resumed at **{Enter Exam Input Form}**.

- *A8: Invalid Time in Exam Input Form*

  At **{Confirm Updating Exam}** or **{Confirm Creating Exam}** if the entered exam time is non-numeric, negative or zero,

  1. The system prompts “Please enter a valid exam time” message.
  2. The flow of events is resumed at **{Enter Exam Input Form}**.

- *A9: Excessive Time for an Exam*

  At **{Confirm Updating Exam}** or **{Confirm Creating Exam}** if the entered exam time exceeds 600 minutes (i.e. 10 hours),

  1. The system prompts “Please enter an appropriate exam time in range 1 and 600 minutes” message.
  2. The flow of events is resumed at **{Enter Exam Input Form}**.

- *A10: No Question Selected for Exam*

  At **{Confirm Updating Exam}** or **{Confirm Creating Exam}** if no question is selected for the exam,

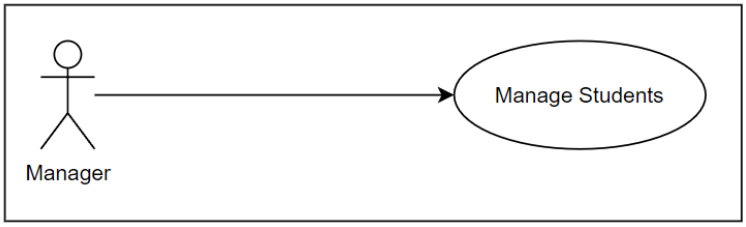
  1. The system prompts “Please select at least one question for the exam” message.
  2. The flow of events is resumed at **{Select Questions}**.

Task 3. Manager Portal

Use Case: Show Grade Statistics

Brief Description
This use case describes how a teacher checks grade statistics.

Use-case Diagram



Basic Flow

1. The use case begins when the user logs in as a teacher and clicks the Grade Statistics button.
2. The system displays a list of results for all the students and the graphical representations of results. The graphs include a bar chart, a pie chart and a line chart.

   {Select Filter Criterion}

3. The user selects a course, an exam and a student from the corresponding drop-down menus. The default values of all drop-down menus are unselected.

   {Click a Button}

4. While a button is clicked,

   4.1 If the Reset button is clicked, the options of the drop-down menus are reset to unselected, but the displayed content remains unchanged.

   4.2 If the Filter button is clicked, the records that match the options in the drop-down menu are shown. If some criteria are unselected, all records that match the other criteria are shown.

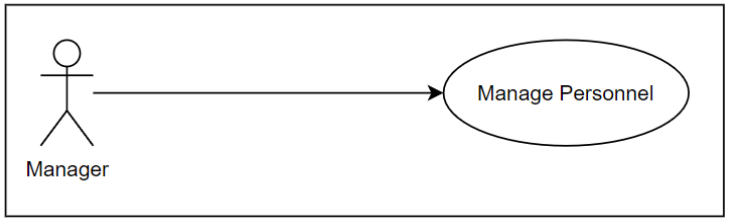
   4.3 If the Refresh button is clicked, the options of the drop-down menus are reset to unselected. Moreover, an automated filtering is performed, i.e., all records are shown.

5. The use case ends

Use Case: Manage Personnel

Brief Description
This use case describes how a manager manages personnel records.

Use-case Diagram



Basic Flow

1. The use case begins when the user logs in as a manager and clicks either the Student Management or the Teacher Management button. The operations below will based on the corresponding personnel dataset.

2. The system displays a list of all registered personnel and a form to add new personnel. The Position column in the list and the position drop-down menu in the form will be displayed if and only if the Teacher Management button is selected.

   {Select a Record}

3. The user clicks a record on the list, the selected record will be highlighted.

   {Enter Filter Criterion}

4. The user enters the username, name and department in the corresponding text field in the filter criterion. The default values are empty strings.

   {Enter Personnel Information}

5. The user enters the username, name, age, department and password in the corresponding text field in the form. The default values in the text fields are empty strings. Then the user selects the gender (and Position if Teacher Management is selected) in the drop-down menu, the default value is unselected.

   {Click a Button}

6. While a button is clicked,

   6.1 If the Reset button is clicked, the values in the text fields of the filter criterion are reset to an empty string.

   6.2 If the Filter button is clicked, the records that match the value in the text fields of the filter criterion are shown. If some text fields are empty, all records that match the other criterions are shown.

   6.3 If the Delete button is clicked, the selected record will be deleted and removed from the list.

6.4 If the Refresh button is clicked, the values in the text fields of filter criterion and form are reset to an empty string. The drop-down menus are reset to unselected. Moreover, an automated filtering is performed, i.e., all records are shown.

6.5 If the Add button is clicked, a new record will be created and added to the database.

6.6 If the Update button is clicked, the Name, Age, Gender, Department and Password (and Position if Teacher Management is selected) of the record corresponding to the Username are updated according to the values in the text fields and the drop-down menu. If some of the text fields or the drop-down menu are empty or unselected, the corresponding value in the record will not be updated.

7. The use case ends.

Alternate Flows

- *A1: No Record Selected*

  At **{Click a Button}** if the Delete button is clicked while no record is selected,

  1. The system informs the user that no record is selected.
  2. The flow of events is resumed at **{Select a Record}**.

- *A2: Information Incomplete*

  At **{Click a Button}** if the Add button is clicked and at least one of the text fields or the drop-down menu in the form is empty or unselected,

  1. The system informs the user that the information of the new personnel is incomplete.
  2. The flow of events is resumed at **{Enter Personnel Information}**.

- *A3: Duplicated Username*

  At **{Click a Button}** if the Add button is clicked and the Username in the form matches with a record in the database,

  1. The system informs the user that the Username is duplicated.
  2. The flow of events is resumed at **{Enter Personnel Information}**.

- *A4: Invalid Username*

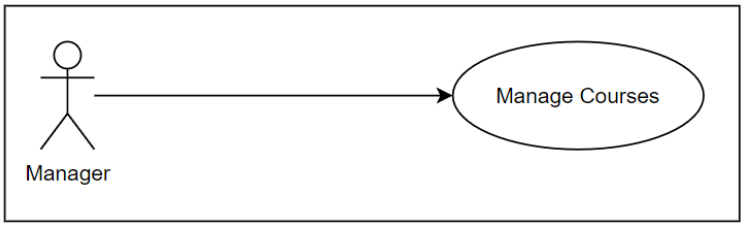
  At **{Click a Button}** if the Update button is clicked and the Username in the form is empty, or the Username is not found in the database,

  1. The system informs the user that the Username is empty, or the Username does not exist.
  2. The flow of events is resumed at **{Enter Personnel Information}**.

Use Case: Manage Courses

Brief Description
This use case describes how a manager manages course records.

Use-case Diagram



Basic Flow

1. The use case begins when the user logs in as a manager and clicks the Course Management button.
2. The system displays a list of all the registered courses.

   {Select a Record}

3. The user clicks a record on the list, the selected record will be highlighted.

   {Enter Filter Criterion}

4. The user enters the Course ID, Course Name and Department in the corresponding text fields in the filter criterion. The default values are empty strings.

   {Enter Course Information}

5. The user enters the Course ID, Course Name and Department in the corresponding text field in the form. The default values in the text fields are the empty string.

   {Click a Button}

6. While a button is clicked,

   6.1 If the Reset button is clicked, the values in the text fields of the filter criterion are reset to an empty string.

   6.2 If the Filter button is clicked, the records that match the value in the text fields of the filter criterion are shown. If some text fields are empty, all records that match the other criterions are shown.

   6.3 If the Delete button is clicked, the selected record will be deleted and removed from the list.

   6.4 If the Refresh button is clicked, the values in the text fields of filter criterion and form are reset to an empty string. Moreover, an automated filtering is performed, i.e., all records are shown.

   6.5 If the Add button is clicked, a new record will be created and added to the database.

6.6 If the Update button is clicked, the Course Name and the Department of the record corresponding to the Course ID are updated according to the values in the text fields. If some of the text fields are empty, the corresponding value in the record will not be updated.

7. The use case ends.

Alternate Flows

- *A1: No Record Selected*

  At **{Click a Button}** if the Delete button is clicked while no record is selected,

  1. The system informs the user that no record is selected.
  2. The flow of events is resumed at **{Select a Record}**.

- *A2: Information Incomplete*

  At **{Click a Button}** if the Add button is clicked and at least one of the text fields in the form is empty,

  1. The system informs the user that the information about the new course is incomplete.
  2. The flow of events is resumed at **{Enter Course Information}**.

- *A3: Duplicated Course ID*

  At **{Click a Button}** if the Add button is clicked and the Course ID in the form matches with a record in the database,

  1. The system informs the user that the Course ID is duplicated.
  2. The flow of events is resumed at **{Enter Course Information}**.

- *A4: Invalid Course ID*

  At **{Click a Button}** if the Update button is clicked and the Course ID in the form is empty, or the Course ID is not found in the database,

  1. The system informs the user that the Course ID is empty, or the Username does not exist.
  2. The flow of events is resumed at **{Enter Course Information}**.