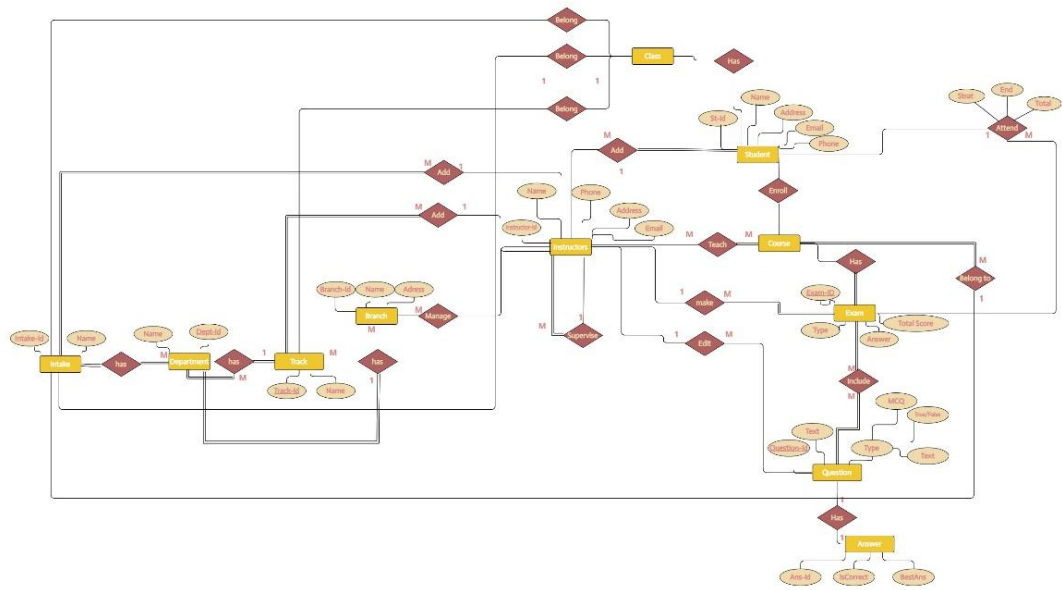# SQL PROJECT

Made by : Naira Gamal Hassan
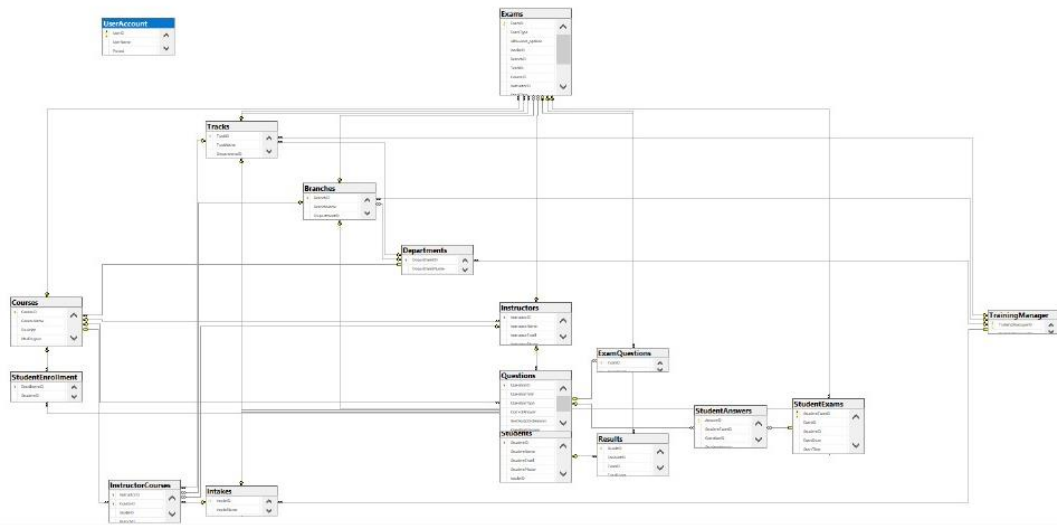
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ERD

Mapping

Project Title:

Examination System Database

System Requirements:

Question Pool Management:

- Provide a question pool for instructors to select questions for exams.
- Support multiple question types: Multiple choice, True & False, Text questions.
- Store correct answers for Multiple choice and True & False questions.
- Validate and store student answers, calculating and storing results.

Course Management:

- Store courses information (Course name, description, Max degree, Min Degree).
- Manage instructors' information, allowing each instructor to teach one or more courses.
- Allow changes in instructors for a course in different classes or years.
- Instructors can edit (add, update, delete) question pools in their courses.

Training Manager Functions:

- Training Manager (One of the instructors) can edit instructors, courses, and instructors for each course.
- Ability to add and edit branches, tracks in each department, and add new intake.
- Add students, defining their personal data, intake, branch, and track.
- User Authentication:
- Provide login accounts for Training Manager, Instructors, and Students.
- Ensure restricted access, allowing each user to access their relevant tasks only.

Exam Creation and Management:

- Instructors can create exams for their courses.

- Specify the number of questions for each type, with the system selecting questions randomly or manually from the question pool.
- Set degrees for each question, ensuring the total does not exceed the course Max Degree.
- Define exam details: type, intake, branch, track, course, start time, end time, total time, and allowance options.

Exam Administration:

- Store information on each exam defined by year, course, and instructor.
- Allow instructors to select students for specific exams, defining exam date, start time, and end time.
- Students can only access and complete the exam during the specified time.

Results Calculation:

- Store students' answers for exams.
- Calculate correct answers and final results for each student in the course.
- Data Insertion and Testing:
- Implement mechanisms to insert test data into all tables.
- Conduct thorough testing to ensure system functionality.

Tables

1. UserAccount
2. Students
3. Instructors
4. Courses
5. Questions
6. Exams
7. StudentsExam
8. Students Answers
9. Branch
10. Track
11. Intake
12. Department
13. ExamQuestions
14. InstructorCourse
15. Training Manager
16. StudentEnrollement
17. Results

Procedures

1- User Account Management:

- Create a new user account
- Update user account
- Delete user account

2-User Authentication:

- Validate user login
- Change user password

3- Course Management:

- Add a new course
- Update a course
- Delete a course
- Get courses by instructor

4- Instructor Management:

- Add a new instructor
- Update an instructor
- Delete an instructor

- Get instructors by course

5- Training Manager Tasks:

- Add a new branch
- Add a new track
- Add a new intake
- Add a new student
- Edit an existing branch
- Edit an existing track
- Edit an existing intake
- Edit an existing student
- Add an instructor to a course
- Remove an instructor from a course

6- Exam Management:

- Create a new exam
- Edit an existing exam
- Delete an exam
- Assign students to an exam
- Set exam start and end times

7-Question Pool Management Procedures:

- Add Question to Pool:
- Update Question in Pool:
- Delete Question from Pool:
- Get questions by course

8- Exam Taking and Results:

- Submit exam answers
- Calculate and store exam results
- Calculate total score (example: sum of question degrees)
- Store the result
- Evaluate Text Question (Check best answer)

Functions

1. **Search Courses by Course Name**
2. **Search Courses by Instructor**
3. **Search Courses by Degree Range**

Views

1. View for Students in a Course:

2. Display Course Enrollment Information.

3. View for Exam results .

4. View for Courses Taught by an Instructor:

5. View for Students' Exam Schedule .

Triggers

1. Trigger to Enforce UserType Constraints.

2. Trigger to Prevent Deleting Instructors Assigned to Courses.

3. Trigger to Enforce MaxDegree and MinDegree Constraints.

4. Trigger to Prevent Deleting Courses with Associated Exams.

5. Trigger to Prevent Deleting Questions Used in Exams.

6. Trigger to prevent updates to Student ID in Student table if related records exist in StudentCourse.

Indexes

- **UserAccount Table**
- **IX_UserAccount_UserType**
- **IX_UserAccount_UserName**
- **IX_TrainingManager_TrainingManagerName:**
- **IX_Instructor_InstructorName**
- **IX_Instructor_CourseID**
- **IX_Student_StudentName**
- **IX_Student_Intake**
- **IX_Student_Branch**
- **IX_Student_Track**
- **IX_Course_CourseName**
- **IX_Department_DepartmentName**
- **IX_Branch_BranchName**
- **IX_Track_TrackName**
- **IX_Track_DepartmentID:**
- **IX_Intake_IntakeName:**
- **IX_Question_CourseID:**
- **IX_Question_InstructorID:**
- **IX_Question_QuestionType:**
- **IX_Exam_IntakeID:**
- **IX_Exam_BranchID:**
- **IX_Exam_TrackID:**

- **IX_Exam_CourseID:**
- **IX_Exam_InstructorID:**
- **IX_ExamQuestion_ExamID:**
- **IX_ExamQuestion_QuestionI**
- **IX_StudentExam_ExamID:**
- **IX_StudentExam_StudentID:**
- **IX_StudentAnswer_StudentExamID:**
- **IX_StudentAnswer_QuestionID:**
- **IX_Result_StudentID:**
- **IX_Result_ExamID:**
- **IX_StudentEnrollment_StudentID:**
- **IX_StudentEnrollment_CourseID:**

Users

User	Password
Admin	**Admin123**
Training Manager	**TrainingManager123**
Instructor	**InstructorPassword123**
Student	**StudentPassword123**