**A yellow and red logo

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**Department of Information and Communication Technology**

**Faculty of Technology**

**University of Ruhuna**

**Database Management Systems Practicum**

**ICT 1222**

**Assignment 02 – Mini Project Group**

**Group Number 15**

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## Brief introduction about the problems and solution of the project

**Database Design Complexity**

* Problem: Designing an efficient and normalized database structure that can handle different types of data (e.g., attendance, marks) is complex and requires careful planning.
* Solution: Using the ERD and relational mapping to clearly define relationships, dependencies, and constraints between entities can help create a streamlined design.

**Handling Attendance with Medical Excuses**

* Problem: Recording attendance accurately and factoring in students with medical excuses poses a challenge, as it affects eligibility calculations.
* Solution: Implement an additional field in the attendance table for medical reasons and use conditional logic in queries to adjust eligibility calculations accordingly.

**Eligibility Calculation Based on Attendance and Marks**

* Problem: Accurately calculating eligibility for exams based on attendance (80% threshold) and continuous assessment (CA) marks (≥ 50%) for each course unit can be complex.
* Solution: Use stored procedures or views to simplify eligibility calculations and automate the process. Testing this logic with multiple cases will help ensure accuracy.

**Calculating SGPA and CGPA Accurately**

* Problem: Calculating Semester GPA (SGPA) and Cumulative GPA (CGPA) based on marks across multiple subjects and ensuring the results are accurate and consistent can be tricky.
* Solution: Use views or functions to calculate SGPA and CGPA accurately. Ensuring consistency in weightage and credits across course units is essential.

## Proposed ER/EER diagram

A diagram of a diagram

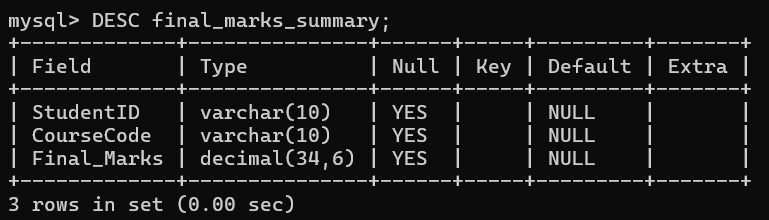
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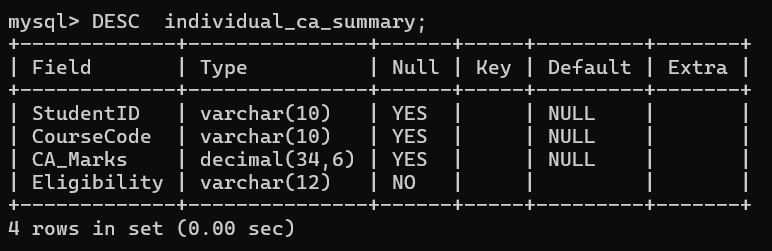
## Proposed Relational mapping Diagram

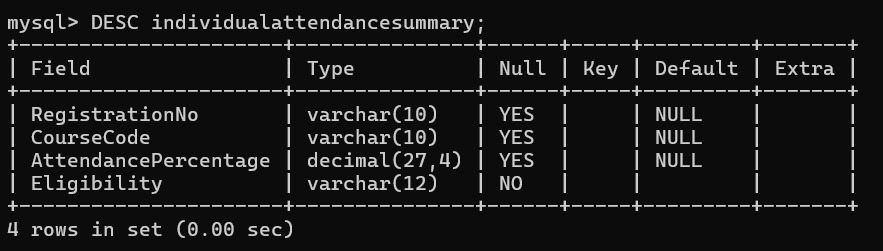
A computer screen shot of a computer program

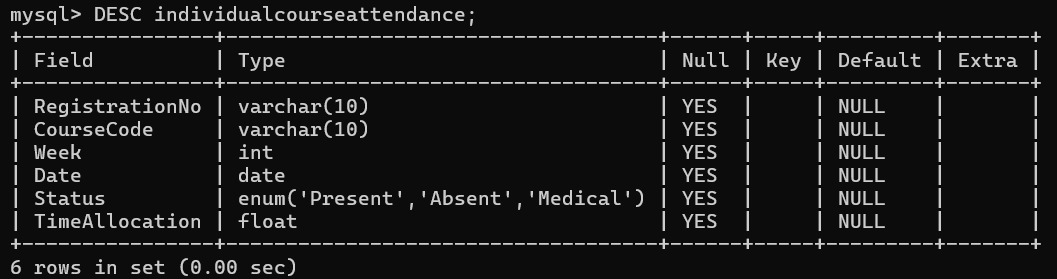
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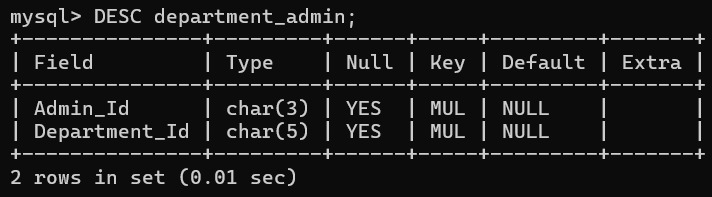
## Table structure of solution

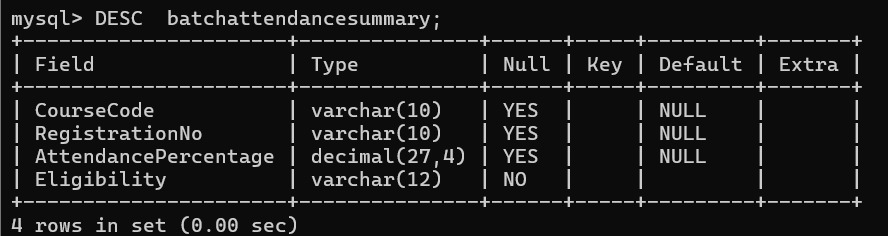


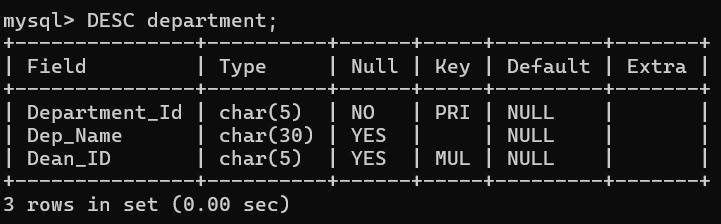


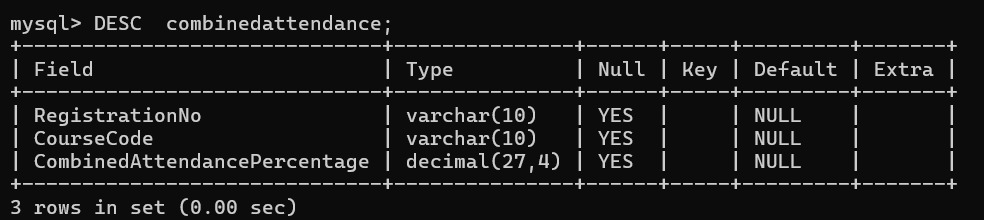


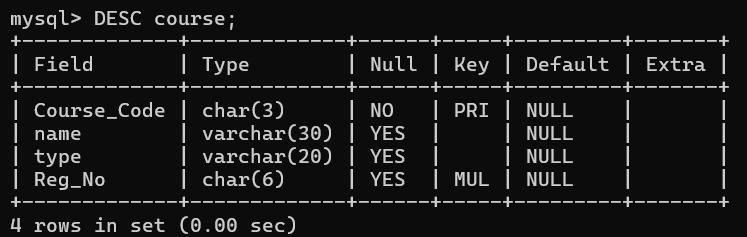


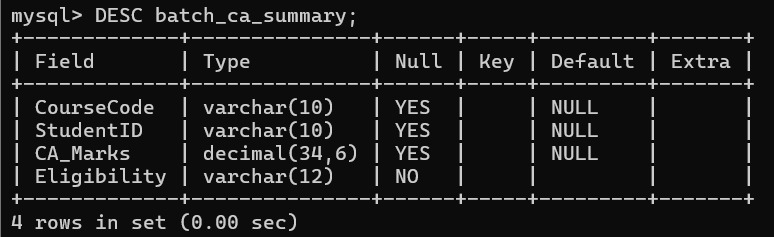


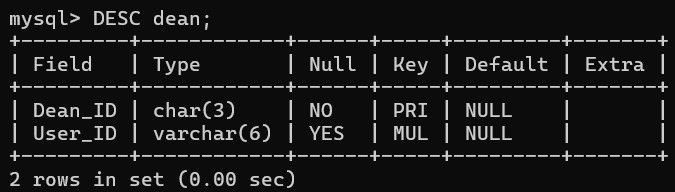


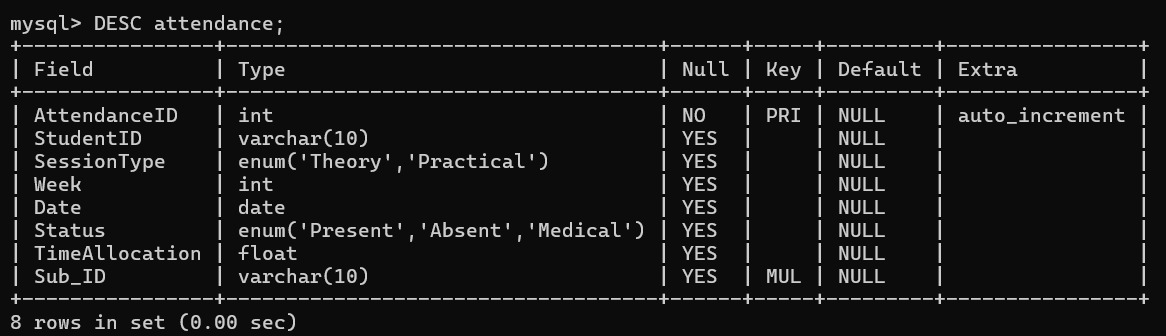


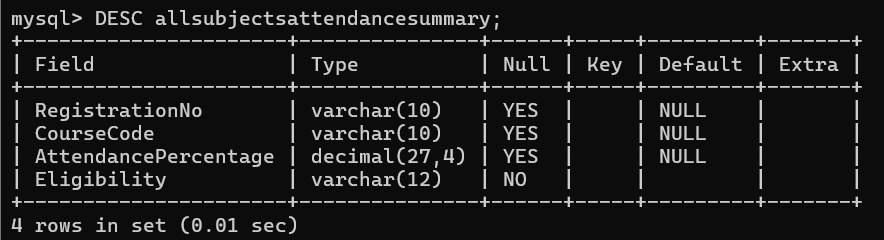


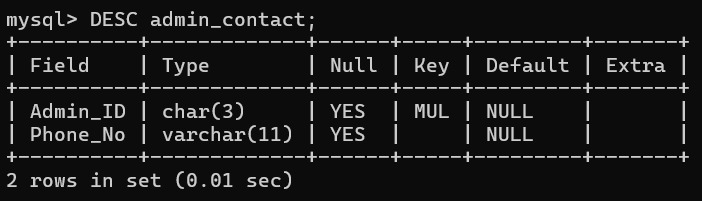


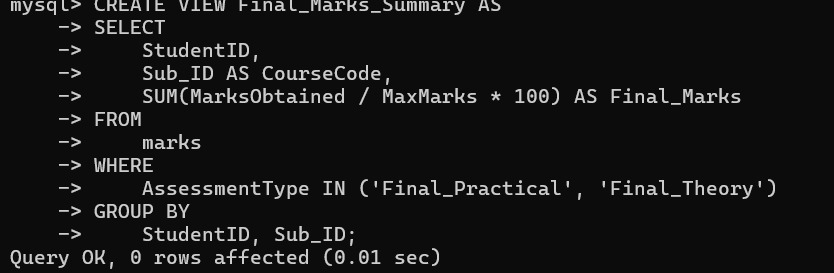


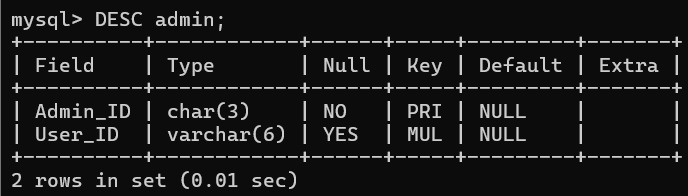


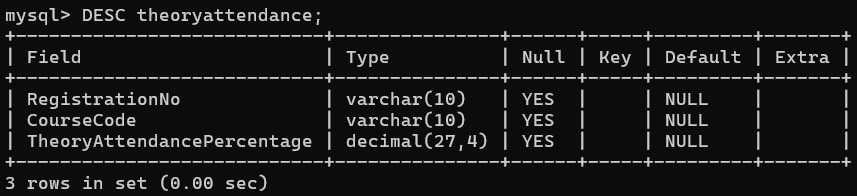


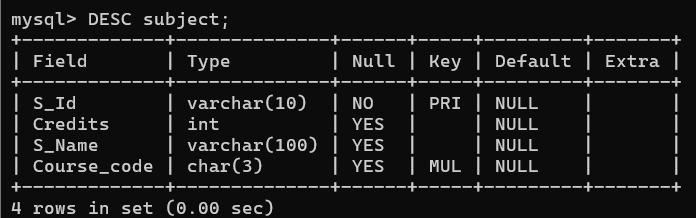


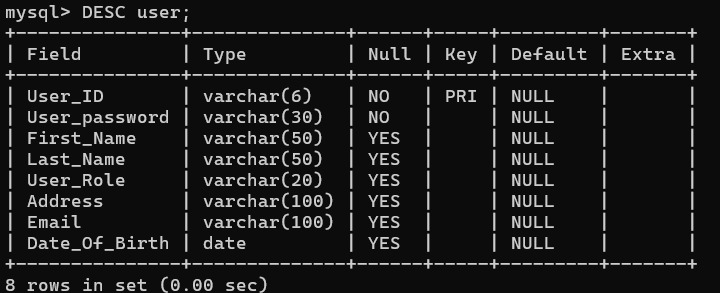


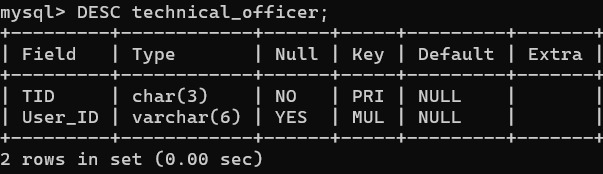


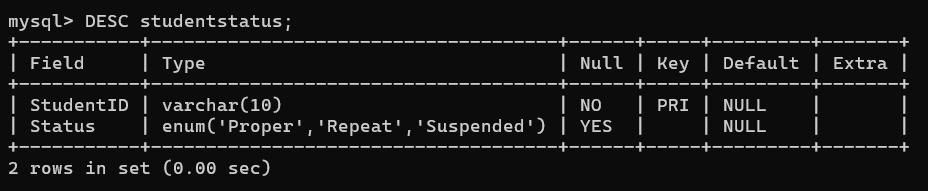


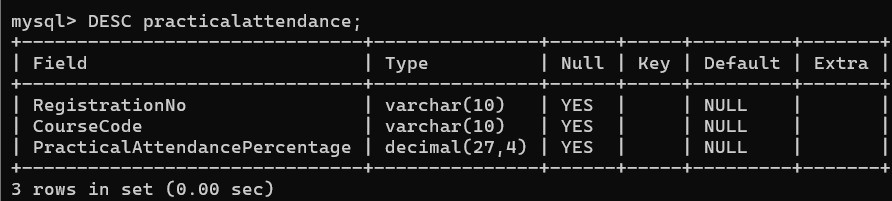


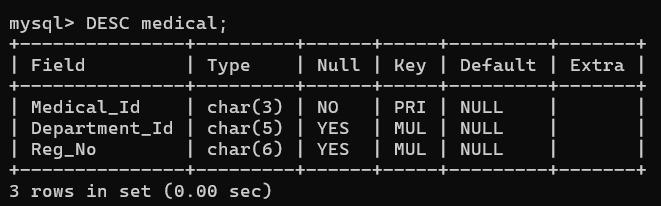


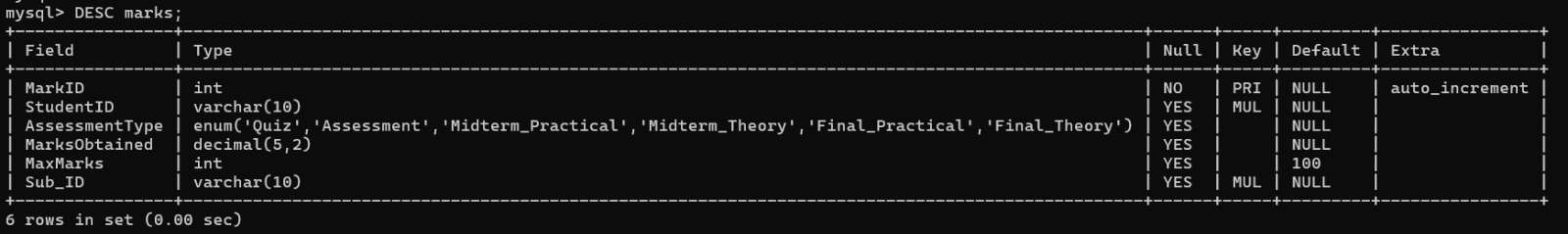


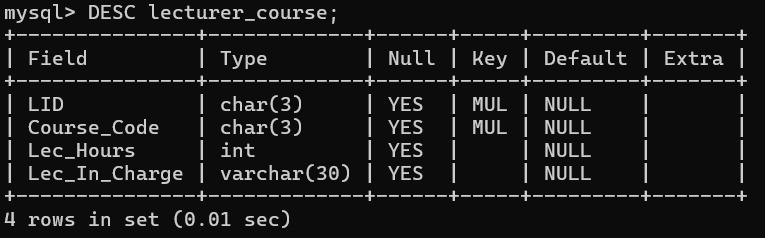


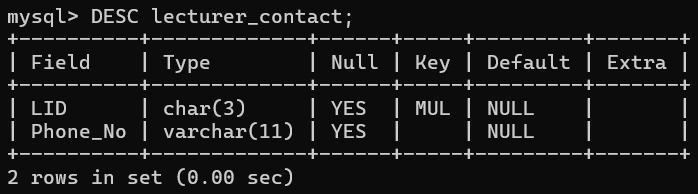


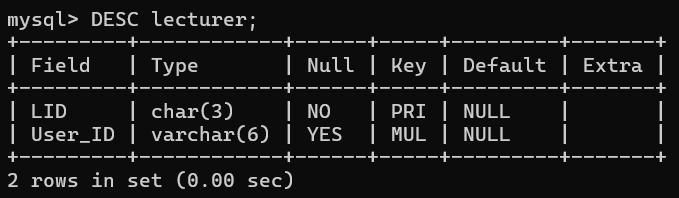












## Tools and technologies that we have used.

* Draw.io:

ER diagram

Relational schema

* MySQL SERVER, VS code, Notepad, MySQL work bench

* GitHub and GitHub Desktop:

6.Security measures that you have taken to protect your Database

|  |  |
| --- | --- |
| Admin | With All privileges with Grant Option for all the tables in the database |
| Dean | With All privileges without Grant for all the tables in the database |
| Lecturer | All privileges without Grant and user creation for all the tables in the database |
| Technical Officer | Read, write, and update permissions for attendance related tables/views. |
| Student | Read permission for final attendance and final marks/Grades tables/views. |

## Views and Functions

View attendance summary by CourseCode

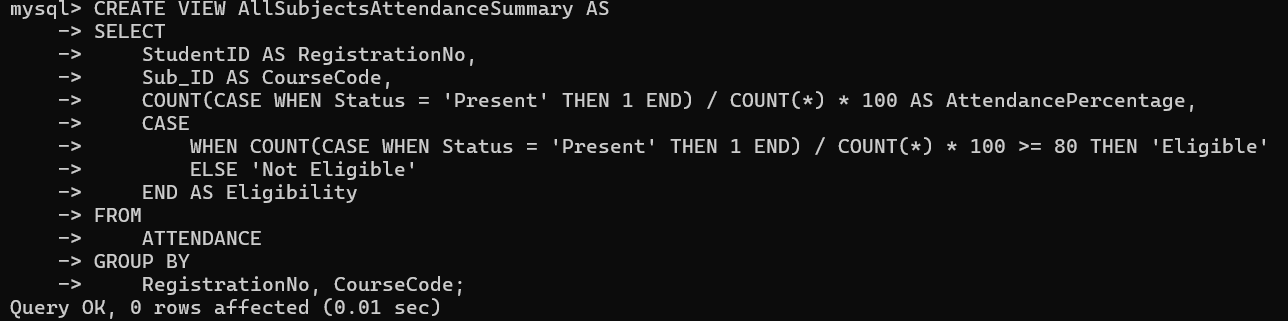
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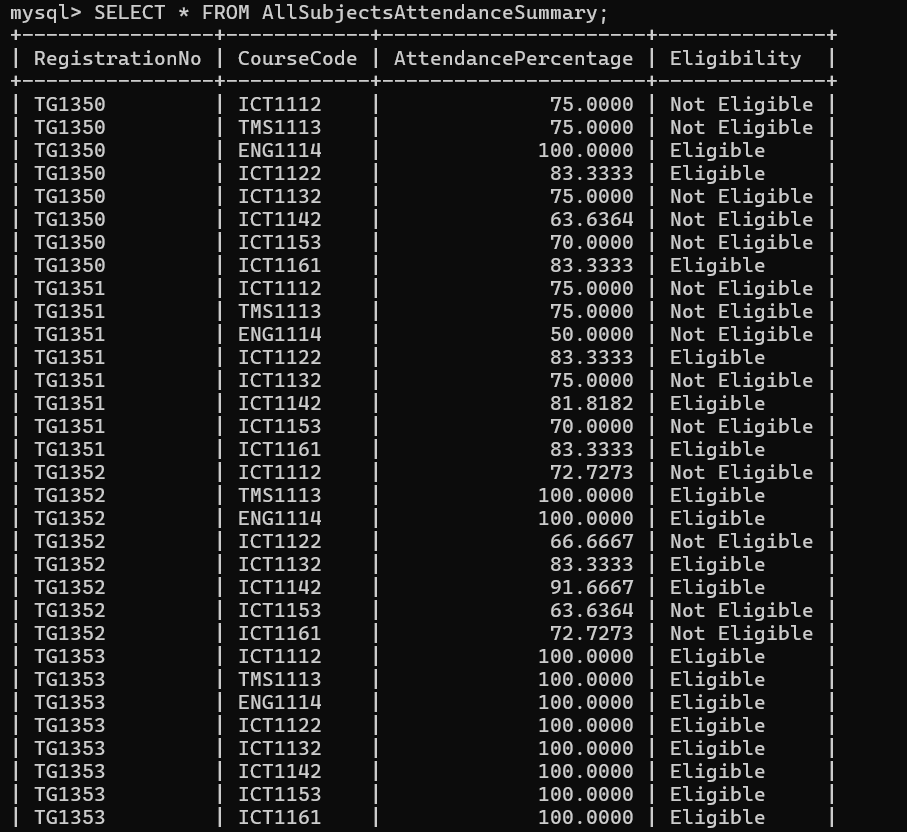
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View Attendance Summary for All Subjects with Percentage and Eligibility





Individual Attendance Summary by Registration Number

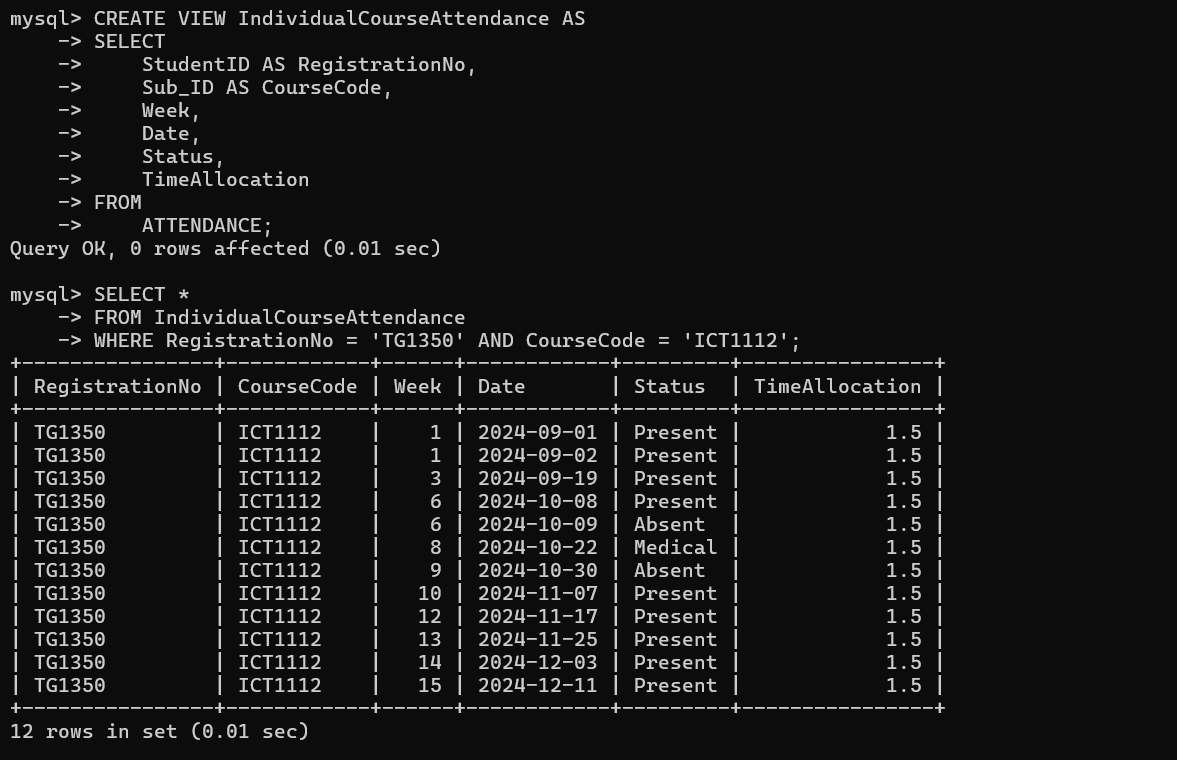
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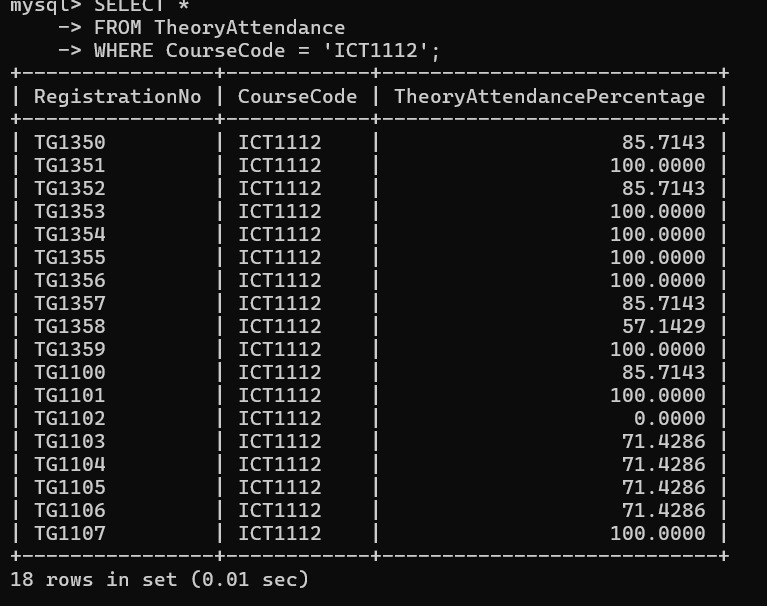
Individual Attendance Summary by Registration Number and Course Code

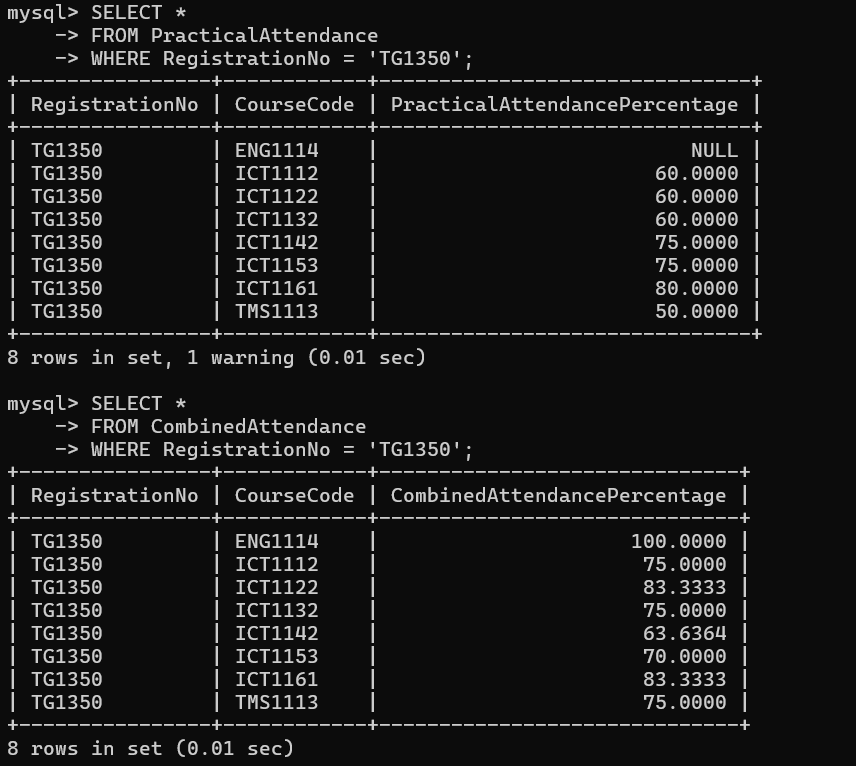


Filtered Views for Theory, Practical, and Combined Sessions

A screen shot of a computer program

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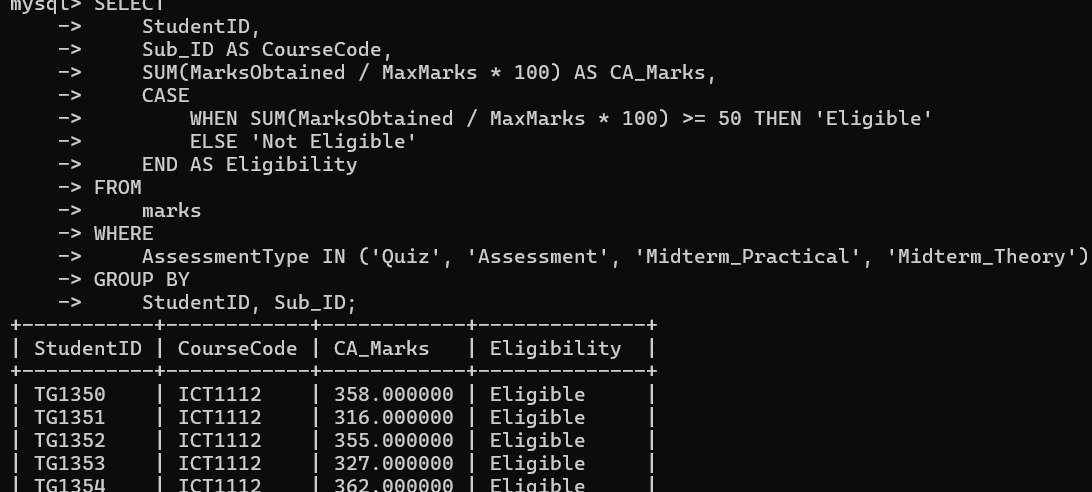




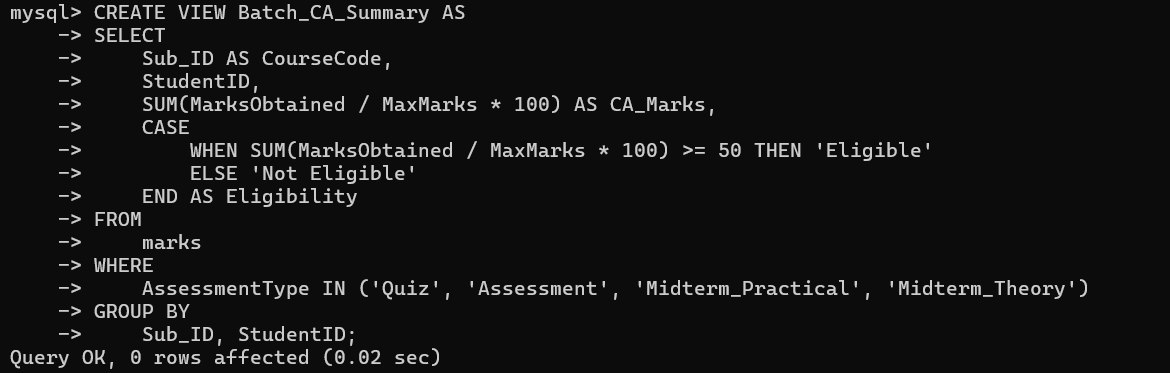
Calculate Continuous Assessment (CA) Marks A screenshot of a computer

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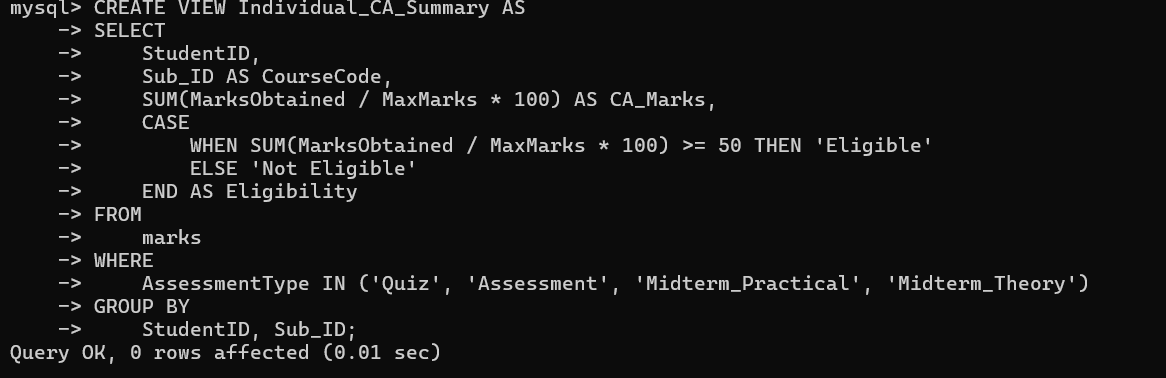
Check Eligibility Based on CA Marks



View CA Marks Summary by Course Code for the Whole Batch



View CA Marks Summary for Individual Students



Final marks view

A screen shot of a computer program

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## Challenges Encountered During Solution Development

* Creating Complex Tables
* Data Maintenance Issues
* Diagram and Mapping Adjustments
* Data Entry Errors

## Solutions Implemented

* Separate Data Sets:

Divided attendance data across separate weekday files to streamline management.

* Automated Typing for Repetitive Entries:

Utilized automation or scripts to reduce redundant typing and improve data consistency.

## Hosting Plans and Considerations

* Platform Choice

Selecting a cloud platform enables database access from any location, real-time updates, and easier maintenance.

* Changes for Cloud Deployment

Adjust data types and optimize for cloud storage.

## References

* Lecture Notes
* W3Schools.com