COURSE - 2 MYSQL DATABASE MANAGEMENT: FINAL LAB ASSESSMENT

INSTRUCTIONS FOR THE LAB ASSESSMENT:

Please read carefully and understand the total number of questions, the time allocated for each question, and the duration of the lab assessment.

- Total number of lab section: Four (4)
- Total number of lab questions to be answered: Twenty (20)
- Time is allocated for each question: 4 minutes.
- Duration of lab assessment: 80 minutes.

LAB: CASE STUDY:

University Database Management and Analytics System

LAB Overview: The University Database Management and Analytics System is a comprehensive solution designed to efficiently manage and analyze data related to a university's various entities, including students, courses, faculty, and administrative staff. The system aims to streamline administrative processes, enhance data integrity, and provide valuable insights through analytics.

1. Tables:

1.1 Departments Table
1.2 Students Table
1.3 Instructors Table
1.4 Courses Table
1.5 Enrolments Table
1.6 Grades Table

Note: The DDL statement for table creation and data insertion (DML statement) will be provided during the assessment.

DeepSphere.AI
Enterprise AI and IIoT for Analytics

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2. Problem Statements:

2.1 DML-Data Manipulation (Answer any 4)

2.1.1. Add a new student "Emma Clark" with an email "emma.clark@uni.edu" and a major in Biology (DepartmentID 4).

2.1.2 Update the major of student John Doe (StudentID 101) to Mathematics (DepartmentID 2).

2.1.3 Delete the course with CourseID 305 which is no longer offered.

2.1.4 Insert a new instructor "Dr. Alice Smith" into the Instructors table with an email "alice.smith@uni.edu" in the English department (DepartmentID 3).

2.1.5 Change the Department Head of the Computer Science department (DepartmentID 1) to InstructorID 205.

2.2 SELECT-Data Querying (Answer any 4)

2.2.1 Retrieve all courses offered by the History department (DepartmentID 5).

2.2.2 List the email addresses of all students enrolled in the "Introduction to Programming" course (CourseID 101).

2.2.3 Show all instructors who do not currently teach any courses.

2.2.4 Display the total number of students in each major.

2.2.5 Find all courses that have never had any enrollment.

2.3 Data Analysis (Answer any 4)

2.3.1 Calculate the average grade achieved in each course.

2.3.2 Determine the total number of courses offered by each department.

2.3.3 Count the number of students who have changed their major at least once.

2.3.4 Identify the department with the highest average student GPA.

2.3.5 Find the total number of credits completed by each student.

2.4 Advanced Data Querying and Analysis (Answer any 4)

2.4.1 Rank students in the "Machine Learning" course

(CourseID 204) based on their grades.

2.4.2 Analyze the year-on-year growth in student enrollments in the Computer Science department.

2.4.3 Compare the average grades of students before and after changing their major.

2.4.4 Determine the semester-wise progression of average grades for students in the Engineering department.

2.4.5 Identify courses with increasing popularity, shown by growing enrollment numbers over the past three years.

2.5 View Creation and Modification (Answer any 4)

2.5.1 Create a view 'StudentContactInfo' displaying student names and email addresses.

2.5.2 Develop a view 'InstructorTeachingLoad' showing the number of courses taught by each instructor per semester.

2.5.3 Establish a view 'DepartmentCourseOfferings' listing all courses offered by each department.

2.5.4 Construct a view 'StudentAcademicPerformance' detailing each student's grades in all their courses.

2.5.5 Modify the 'DepartmentCourseOfferings' view to include the total number of enrolled students for each course.

Conclusion:

The University Database Management and Analytics System is a pivotal solution poised to transform university operations. By centralizing data and automating key processes, the system enhances efficiency, security, and decision-making. Its user-friendly interface ensures accessibility, while scalability and maintenance features cater to future growth. This Lab aspires to create a dynamic and robust platform, aligning with the evolving needs of a modern educational institution.