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# Internship Task - RDBMS and SQL Task #1

SQL case-based assignment using a **University Database** schema. This assignment will involve queries related to students, courses, departments, professors, and enrollments. I'll walk through the case, describe the database schema, and then provide 10 SQL queries related to university data analysis.

## Database Schema

**`Students` Table:** 2 = 20

| Column Name | Data Type | Description |
|---|---|---|
| student_id | INT | Primary key |
| first_name | VARCHAR(100) | Student's first name |
| last_name | VARCHAR(100) | Student's last name |
| email | VARCHAR(100) | Student's email address |
| phone | VARCHAR(20) | Student's phone number |
| date_of_birth | DATE | Student's date of birth |
| enrollment_date | DATE | Date the student enrolled |
| department_id | INT | Foreign key (references `Departments`) |

**`Courses` Table:** 4 = 10

| Column Name | Data Type | Description |
|---|---|---|
| course_id | INT | Primary key |
| course_name | VARCHAR(100) | Course name |
| department_id | INT | Foreign key (references `Departments`) |
| professor_id | INT | Foreign key (references `Professors`) |
| credits | INT | Number of credits for the course |

**`Departments` Table:** 1 = 10

| Column Name | Data Type | Description |
|---|---|---|
| department_id | INT | Primary key |
| department_name | VARCHAR(100) | Department name |

**`Professors` Table:** 3 = 10

| Column Name | Data Type | Description |
|---|---|---|
| professor_id | INT | Primary key |
| first_name | VARCHAR(100) | Professor's first name |
| last_name | VARCHAR(100) | Professor's last name |
| email | VARCHAR(100) | Professor's email address |
| phone | VARCHAR(20) | Professor's phone number |

**`Enrollments` Table:** 5 = 20

| Column Name | Data Type | Description |
|---|---|---|
| enrollment_id | INT | Primary key |
| student_id | INT | Foreign key (references `Students`) |

| Column Name | Data Type | Description |
|---|---|---|
| course_id | INT | Foreign key (references `Courses`) |
| enrollment_date | DATE | Date the student enrolled in the course |
| grade | VARCHAR(5) | Grade received in the course |

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## Case Study: University Data Analysis

**Background:**

You are a database analyst for a university. The university wants to generate several reports based on student enrollment, courses, professors, departments, and performance analysis.

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## SQL Queries for the Case Study

**1. Find the Total Number of Students in Each Department**

**2. List All Courses Taught by a Specific Professor**

**3. Find the Average Grade of Students in Each Course**

**4. List All Students Who Have Not Enrolled in Any Courses**

**5. Find the Number of Courses Offered by Each Department**

**6. List All Students Who Have Taken a Specific Course (e.g., 'Database Systems')**

**7. Find the Most Popular Course Based on Enrollment Numbers**

**8. Find the Average Number of Credits Per Student in a Department**

**9. List All Professors Who Teach in More Than One Department**

**10. Get the Highest and Lowest Grade in a Specific Course (e.g., 'Operating Systems')**

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## Task Summary:

This SQL case study simulates the analysis of university-related data, with queries that focus on **students**, **courses**, **professors**, **departments**, and **enrollments**. The queries are designed to answer various questions such as finding the total number of students in a department, identifying the most popular courses, calculating average grades, and analyzing professor workloads across departments.

Each query uses SQL concepts such as `JOIN`, `GROUP BY`, `COUNT()`, `AVG()`, `MAX()`, `MIN()`, and filtering with `WHERE`. The data analysis could be useful for academic planning, performance tracking, and resource allocation within the university.