Lab Activity

Scenario 1:

You have been hired as a **Database Administrator** at a university to design and manage a **Course Enrollment System**. The university wants a database that efficiently stores and manages information about **students, departments, courses, and enrollments**.

Your job is to **create the database**, enforce **data integrity constraints**, and ensure that all records follow the university's rules.

Business Rules:

1. Every **student** must have a **unique StudentID**, a **valid email**, and must be at least **17 years old**.
2. Each **student must belong to a department**, and each department has a unique **DepartmentID**.
3. Each **course is associated with a department**, and every course has a **positive number of credit hours**.
4. **Students enroll in courses** every semester, and their **grades are recorded**.
5. The university ensures **no enrollments exist for non-existent students or courses**.
6. If a **department is deleted**, all associated **students and courses should be removed automatically**.
7. By default, enrollments are recorded for the **Spring 2025** semester if no semester is specified.

Scenario 2:

You have been hired as a **Database Administrator** for a university library. The library needs a **database system** to manage **books, students, and book borrowing records**. Your job is to **design the database**, enforce **data integrity constraints**, and ensure smooth operations for book borrowing and returns.

Business Rules:

1. Each **student** must have a **unique StudentID**, a **valid email**, and must be at least **17 years old** to register.
2. Each **book** has a **unique BookID**, a **title**, an **author**, and must belong to a **specific category** (e.g., Fiction, Science, History).
3. Students can **borrow multiple books**, but they **cannot borrow the same book more than once at the same time**.
4. A book can be **borrowed for a maximum of 14 days**, and the borrowing record should store the **borrow date and return date**.

5. If a **student is removed from the system**, their **borrowing records should also be deleted automatically**.
6. If a **book is removed**, its **borrowing records should also be deleted** to maintain data consistency.
7. The default **borrow date** is the **current date**, and the return date should be set within 14 days of borrowing.

Task:

You need to **create database schemas for both scenarios, insert sample data, and test constraint violations.**