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Description automatically generated**Lab 12: Snow College Business Rules, Views and Query Practice**

LIS464 – Applied Database Design

Information School, University of Wisconsin-Madison

**Lab Instructions**

Use the following ERD as a basis for your answer. The ERD below does not show all the below business rules.

A diagram of a class

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**Problem Set 1: Business Rules**

Use a **Business Rule specification sheet** (provided below) to specify the details of **each of the Business Rules listed below (See Hernandez chapter on business rules):**

1.1 Business Rule 1: **Field Specific (Range of Values):** ClassDays only include Mondays, Tuesdays, Wednesdays and Thursdays.

1.2 Business Rule 2: **Relationship-oriented (Cascade Default**) If a lecturer leaves the college, the person will be deleted from the database, and all the classes he/she has taught will be marked as taught by “Unavailable”.

1.3 Business Rule 3: **Relationship-oriented (FK null**) Not every class has an instructor. Every row in the classes table does not have valid instructor ID.

**Provided below is an empty business rule specification sheet that you can use. Fill out this specification sheet for the 3 business rules outlined above. You should list 3 separate copies of the specification sheet.**

**Business Rule Specification Sheet**

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| **Rule Information**  **Rule Statement:** ClassDays only include Mondays, Tuesdays, Wednesdays and Thursdays.  **Constraint**:  **Type**: Database Oriented **Category**: Field Specific  Application Oriented Relationship Specific |
| **Structure Affect:**  Field Names: ClassDay  Table Names: Classes |
| **Field Elements affected:**  Data Type Character Support  Data length Null Support  Decimal Points Range of Values  Key Type Default Value |
| **Relationship Characteristics Affected**  Degree of Participation Type of Relationship  Deletion Rule |
| **Actions Taken to Change the Database from the Default ERD shown above.**  Only range of ClassDay must be tweaked |

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| **Rule Information**  **Rule Statement**: If a lecturer leaves the college, the person will be deleted from the database, and all the classes he/she has taught will be marked as taught by “Unavailable”.  **Constraint**:  **Type**: Database Oriented **Category**: Field Specific  Application Oriented Relationship Specific |
| **Structure Affect:**  Field Names:  Table Names: Lecturers, Classes, |
| **Field Elements affected:**  Data Type Character Support  Data length Null Support  Decimal Points Range of Values  Key Type Default Value |
| **Relationship Characteristics Affected**  Degree of Participation Type of Relationship  Deletion Rule |
| **Actions Taken to Change the Database from the Default ERD shown above.**  **Default value of Unavailable must be implemented to all places where LecturerID is used as an FK** |

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| **Rule Information**  **Rule Statement**: Not every class has an instructor. Every row in the classes table does not have valid instructor ID.  **Constraint**:  **Type**: Database Oriented **Category**: Field Specific  Application Oriented Relationship Specific |
| **Structure Affect:**  Field Names: LecturerID  Table Names: Classes, Lecturers |
| **Field Elements affected:**  Data Type Character Support  Data length Null Support  Decimal Points Range of Values  Key Type Default Value |
| **Relationship Characteristics Affected**  Degree of Participation Type of Relationship  Deletion Rule |
| **Actions Taken to Change the Database from the Default ERD shown above.**  **Null support changes means that the degree of participation must be changed between the Classes table and Lecturers table to include 0** |

**Problem Set 2 Views**

**Question 2**: Suppose that the College will need to check frequently for the information listed below. **For each of the enquiries below, please provide the text of the SQL statement that would create the view.** .

2.1 Virtual Aggregate table – (Hint needs COUNT and GROUP BY) How many total classes each student has taken regardless of semester? List student last name, first name, and the number of classes each student has taken (across multiple semesters).

SELECT S.StuLastName, S.StuFirstName, COUNT(C.StudentID) AS TotalClasses

FROM Students S

INNER JOIN Classes C ON S.StudentID = C.StudentID

INNER JOIN Semesters Se ON C.SemesterID = Se.SemesterID

GROUP BY StudentID

2.2 Virtual Aggregate table – (Hint needs COUNT and GROUP BY and HAVING) How many classes were offered each semester in 2022? List the semester name and the number of classes offered that semester.

SELECT S.SemesterName, COUNT(C.ClassID) AS ClassNumber

FROM Semesters S

INNER JOIN Classes C On S.SemesterID = C.SemesterID

GROUP BY S.SemesterID,

HAVING S.SemesterYear = “2022”

**Part 3 Advanced Query Practice –**

**Use the Snow College ERDs to practice your queries.**

3.1 FOUR table query! Write the SQL query to produce a report for each student that lists which classes they have taken each semester. List the student first name, last name, class name and semester name.

SELECT S.StuFirstName, S.StuLastName, C.ClassName, Se.SemesterName

FROM Students S

INNER JOIN StudentClasses SC ON S.StudentID = SC.StudentID

INNER JOIN Classes C ON SC.ClassID = C.ClassID

INNER JOIN Semesters Se ON C.SemesterID = Se.SemesterID

3.2 outer join. Write the SQL query to list all the classIDs, and instructor names, including classes that don’t yet have an assigned instructor.

SELECT C.ClassID, L.LecLastName, L.LecFirstName

FROM Classes C

LEFT JOIN Lecturers L ON C.LecturerID = L.LecturerID

3.3 outer join. Write the SQL query to list all the lecturers and the ClassIDs they teach, include lecturers that are not teaching any classes.

SELECT C.ClassID, L.LecLastName, L.LecFirstName

FROM Lecturer L

LEFT JOIN Classes C ON L.LecturerID = C.LecturerID

3.4. (the tricky one) Write the SQL query to list just the lecturers who are not currently assigned a class.

SELECT C.ClassID, L.LecLastName, L.LecFirstName

FROM Lecturer L

LEFT JOIN Classes C ON L.LecturerID = C.LecturerID

WHERE C.LecturerID IS NULL