

INLS 623 – Assignment 2

Ramakrishnan Chapter 5, Exercise 5.7 parts [2,3,4] (Page 178)

Consider the following relational schema and briefly answer the questions that follow:

Emp(eid: integer, *ename*: string, *age*: integer, *salary*: real)

Works(eid: integer, did: integer, *pct_time*: integer)

Dept(did: integer, *budget*: real, *managerid*: integer)

2. Define a table constraint on Dept that will ensure that all managers have $age > 30$
3. Define an assertion on Dept that will ensure that all managers have $age > 30$. Compare this assertion with the equivalent table constraint. Explain which is better.
4. Write SQL statements to delete all information about employees whose salaries exceed that of the manager of one or more departments that they work in. Be sure to ensure that all the relevant integrity constraints are satisfied after your updates.

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(NOTE: for 5.8.2.e use “Database Systems” instead of “Math101”)

Consider the following relations:

Students(snum: integer, *sname*: string, *major*: string, *level*: string, *age*: integer)

Class(*name*: string, *meets_at*: time, *room*: string, *fid*: integer)

Enrolled(snum: integer, cname: string)

Faculty(fid: integer, *fname*: string, *deptid*: integer)

The meaning of these relations is straightforward; for example, Enrolled has one record per student-class pair such that the student is enrolled in the class.

Express each of the following integrity constraints in SQL unless it is implied by the primary and foreign key constraint; if so, explain how it is implied. If the constraint cannot be expressed in SQL, explain why. For each constraint, state what operations (inserts, deletes and updates on specific relations) must be monitored to enforce the constraint

- d. Only faculty in the department with $deptid=33$ teach more than three courses.
- e. Every student must be enrolled in the course called “Database Systems”.
- g. Two classes cannot meet in the same room at the same time.
- k. The number of CS majors must be more than the Math majors.

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Consider the following relational schema. An employee can work in more than one department; the *pct_time* field of the Works relation shows the percentage of time that a given employee works in a given department.

Emp(eid: integer, *ename*: string, *age*: integer, *salary*: real)

Works(eid: integer, did: integer, *pct_time*: integer)

Dept(did: integer, *budget*: real, *managerid*: integer)

Write SQL-92 integrity constraints (domain, key, foreign key, CHECK constraints or assertions) or SQL:1999 triggers to ensure each of the following requirements, considered independently.

2. Every manager must also be an employee
4. A manager must always have a higher salary than any employee that he or she manages.

Foreign Key Question:

Foreign Keys are not supported in MySQL. Describe how you would enforce the foreign key integrity relationship “values for pilot IDs (eid) in entries in the certified table must correspond to PilotIDs defined in the employees table (employees.eid)” in our MySQL database. Be sure to include working SQL code if that is part of your description.