201533661 이승수’s database homework#4 date: 2016. 10. 15.

**4.5 Show how to deﬁne the view student grades (ID, GPA) giving the grade point average of each student, based on the query in Exercise 3.2; recall that we used a relation grade points(grade, points) to get the numeric points associated with a letter grade. Make sure your view deﬁnition correctly handles the case of null values for the grade attribute of the takes relation**.

This query considers the case devided by zero, returns null.

create view student\_grades(ID, GPA) as

select ID, credit points / decode(credit sum, 0, NULL, credit sum)

from ((select ID, sum(decode(grade, NULL, 0, credits)) as credit sum, sum(decode(grade, NULL, 0, credits\*points)) as credit points from(takes natural join course) natural join grade points group by ID) union select ID, NULL from student where ID not in (select ID from takes))

**4.7 Consider the relational database of Figure 4.11. Give an SQL DDL deﬁnition of this database. Identify referential-integrity constraints that should hold, and include them in the DDL deﬁnition.**

employee (employee\_name varchar(20)not null, street varchar(20), city varchar(15))

works (employee\_name varchar(20)not null, company\_name varchar(20), salary numeric(8,2))

company (company \_name varchar(20)not null, city varchar(15))

manages (employee\_name varchar(20)not null, manager\_name varchar(20))

**4.9 SQL allows a foreign-key dependency to refer to the same relation, as in the following example:**

***create table manager (***

***employee\_name varchar(20) not null,***

***manager\_name varchar(20) not null,***

***primary key employee name,***

***foreign key (manager\_name) references manager on delete cascade )***

**Here, employee name is a key to the table manager, meaning that each employee has at most one manager. The foreign-key clause requires that every manager also be an employee. Explain exactly what happens when a tuple in the relation manager is deleted.**

When tuple in the relation manager is deleted, attribute manager\_name is deleted because of ‘on delete cascade’ clause on last. Then the foreign key set to null or default if default is settled.

**4.14 Show how to deﬁne a view tot\_credits (year, num credits), giving the total number of credits taken by students in each year.**

Create view totCredit as select year,credits from student,takes,course where student.ID=takes.ID and takes.course\_id=course.course\_id;

**4.16 Referential-integrity constraints as deﬁned in this chapter involve exactly two relations. Consider a database that includes the relations shown in Figure4.12. Suppose that we wish to require that every name that appears in address appears in either salaried worker or hourly worker, but not necessarily in both.**

**a. Propose a syntax for expressing such constraints.**

Salaried worker(name varchar(20)not null, phone numeric(8,2), salary numeric(3,0)

Primary key(name) references Address on update cascade);

Hourly worker(name varchar(20)not null, hourly\_wage numeric(3,0)

Primary key(name) references Address on update cascade);

Address(name varchar(20)not null, street varchar(20), city varchar(15));

**b. Discuss the actions that the system must take to enforce a constraint of this form.**

The system must synchronize the salaried worker,hourly worker and Address table. For that salaried and hourly worker’s names have to be cascaded the name from Address table.