CS1555 Recitation 3

Objective: To practice the relational model and SQL DDL

Consider the following relation schemas and states:

STUDENT (sid, name, class, major)
STUDENT_DIR (sid, address, phone)
COURSE_TAKEN (course_no, term, sid, grade)
COURSE (course_no, name, level)

1. What are the arities and cardinalities of the relations?

STUDENT

sid	name	class	major
123	John	3	CS
124	Mary	3	CS
126	Sam	2	CS
129	Julie	2	Math

Arity =
Cardinality =

STUDENT _DIR

sid	address	phone
123	333 Library St	555-535-5263
124	219 Library St	555-963-9635
129	555 Library St	555-123-4567

Arity =
Cardinality =

COURSE

course_no	name	course_level
CS1520	Web Programming	UGrad
CS1555	Database Management Systems	UGrad
CS1550	Operating Systems	UGrad
CS 1655	Secure Data Management and Web Applications	Ugrad
CS2550	Database Management Systems	Grad

Arity =
Cardinality =

COURSE_TAKEN

course_no	term	sid	grade
CS1520	Fall 19	123	3.75
CS1520	Fall 19	124	4
CS1520	Fall 19	126	3
CS1555	Fall 19	123	4
CS1555	Fall 19	124	NULL
CS1550	Spring 20	123	NULL
CS1550	Spring 20	124	NULL
CS1550	Spring 20	126	NULL
CS1550	Spring 20	129	NULL
CS2550	Spring 20	124	NULL
CS1520	Spring 20	126	NULL

Arity =
Cardinality =

2. Find the primary key of each relation, assuming that a student is allowed to take each course only once.

3. Now given that a student may re-take a course if she or he fails to obtain a proper grade for that course, what is the primary key of the Course-taken relation?

4. Find the foreign key(s) of each relation, if any. Where does each foreign key reference to?

5. Use CREATE TABLE statement to create tables for each of the relations above. You need to define the primary keys, foreign keys and any other constraints.

6. What will happen if the first two CREATE TABLE statements are switched. Will the statements run smoothly without a problem?

7. Would the following actions be valid given the current data? If not, why?

- Add a tuple <CS1550, Fall 19, 130, NULL> to COURSE_TAKEN
- Delete the tuple <CS1520, Fall 19, 126, NULL> from COURSE_TAKEN
- Delete the tuple <123, John, 3, CS> from STUDENT
- Delete the tuple <123, John, 3, CS> from STUDENT, with foreign keys referring to ***sid*** in the Student table are declared with the "ON DELETE CASCADE" option
- Delete the tuple <123, 333 Library St, 555-535-5263> from STUDENT_DIR
- In the table COURSE, update the ***name*** of the course CS1520 to Java Programming
- In the table COURSE, update the ***course_no*** of the course CS1520 to CS7896
- In the table COURSE, update the ***course_no*** of the course CS1520 to CS7896, with foreign keys referring to ***course_no*** in COURSE table are declared with the "ON UPDATE CASCADE" option