

PG-DAC Sept 2022
Database Technologies
Assignment 1

A university DB contains information about professors (identified by SIN) and courses (identified by course ID). Professors teach courses; each of the following situations concerns the Teaches relationship set.

List all candidate keys of the Teaches relationship set. a. Professors can teach the same course in several semesters, and each offering must be recorded. b. Professors can teach the same course in several semesters, but only the most recent such offering needs to be records. Assume the above Situation (b) applies in all subsequent situations.

List all the keys possible in each of the following situations.

a. Every professor teaches a course, and every course is taught by some professor. b. Every professor teaches exactly one course, and every course is taught by exactly one professor.

Explanation: -

Entity sets

- professor: with SIN underlined as the primary key,
- course: with CID underlined as the primary key,
- semester: with SID underlined as the primary key.

Relationship set

- teaches : associates professor, course and semester. No other attributes. The cardinality constraint is m-to-m. There is a single candidate key of the teaches relationship: {SIN, CID, SID}. The participation constraint can be anything; let say that it is total on professor and course entity sets.

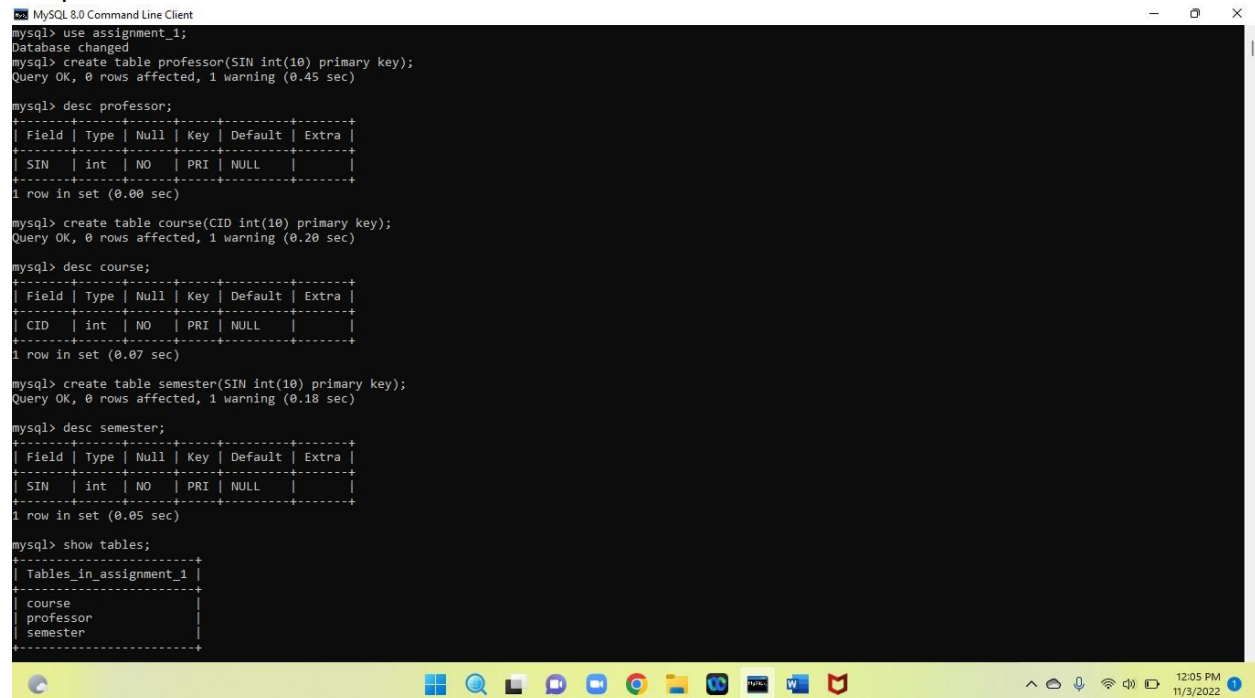
Semester does not need to be an entity set here. Teaches is a binary relation between professor and course. Semester is attribute of teaches. The key of teaches is {SIN, CID}.

This means total participation from professors and total participation from courses. Because it is still m-to-m, the candidate key remains {SIN, CID}.

This time the relationship is 1-to-1. There are now two candidate keys: either {SIN} or {CID}.

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Output: -



```
mysql> use assignment_1;
Database changed
mysql> create table professor(SIN int(10) primary key);
Query OK, 0 rows affected, 1 warning (0.45 sec)

mysql> desc professor;
+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+
| SIN   | int  | NO   | PRI | NULL    |       |
+-----+
1 row in set (0.00 sec)

mysql> create table course(CID int(10) primary key);
Query OK, 0 rows affected, 1 warning (0.20 sec)

mysql> desc course;
+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+
| CID   | int  | NO   | PRI | NULL    |       |
+-----+
1 row in set (0.07 sec)

mysql> create table semester(SIN int(10) primary key);
Query OK, 0 rows affected, 1 warning (0.18 sec)

mysql> desc semester;
+-----+
| Field | Type | Null | Key | Default | Extra |
+-----+
| SIN   | int  | NO   | PRI | NULL    |       |
+-----+
1 row in set (0.05 sec)

mysql> show tables;
+-----+
| Tables_in_assignment_1 |
+-----+
| course                  |
| professor               |
| semester                |
+-----+
```

The screenshot shows the MySQL 8.0 Command Line Client interface. The user has successfully created three tables: 'professor', 'course', and 'semester'. Each table has a single integer primary key column. The 'show tables' command lists all three tables in the current database. The Windows taskbar at the bottom shows the time as 12:05 PM on 11/3/2022.