Name: Govind Arvind Kulkarni

Roll No: 220950320068

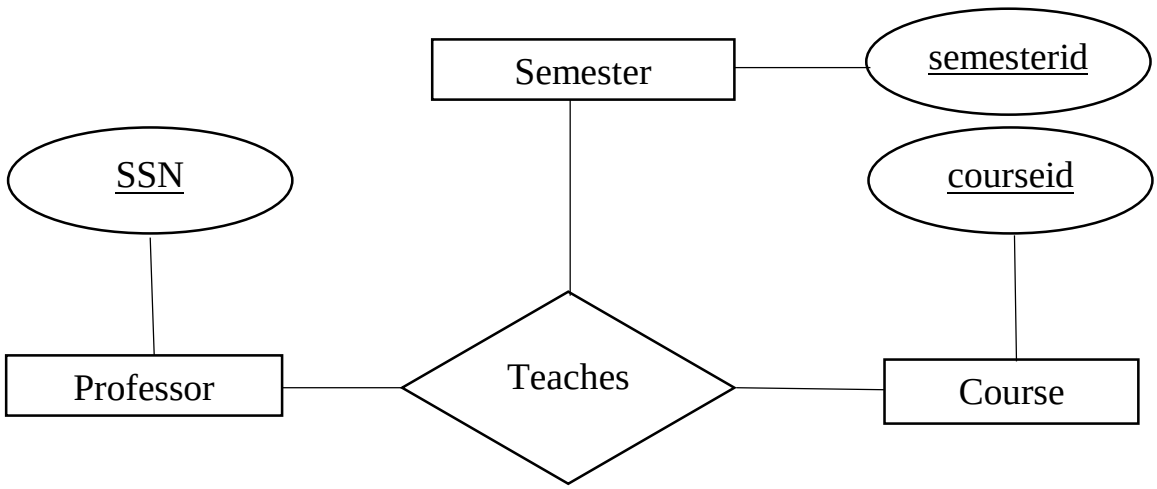
DBT Assignment – 1

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.

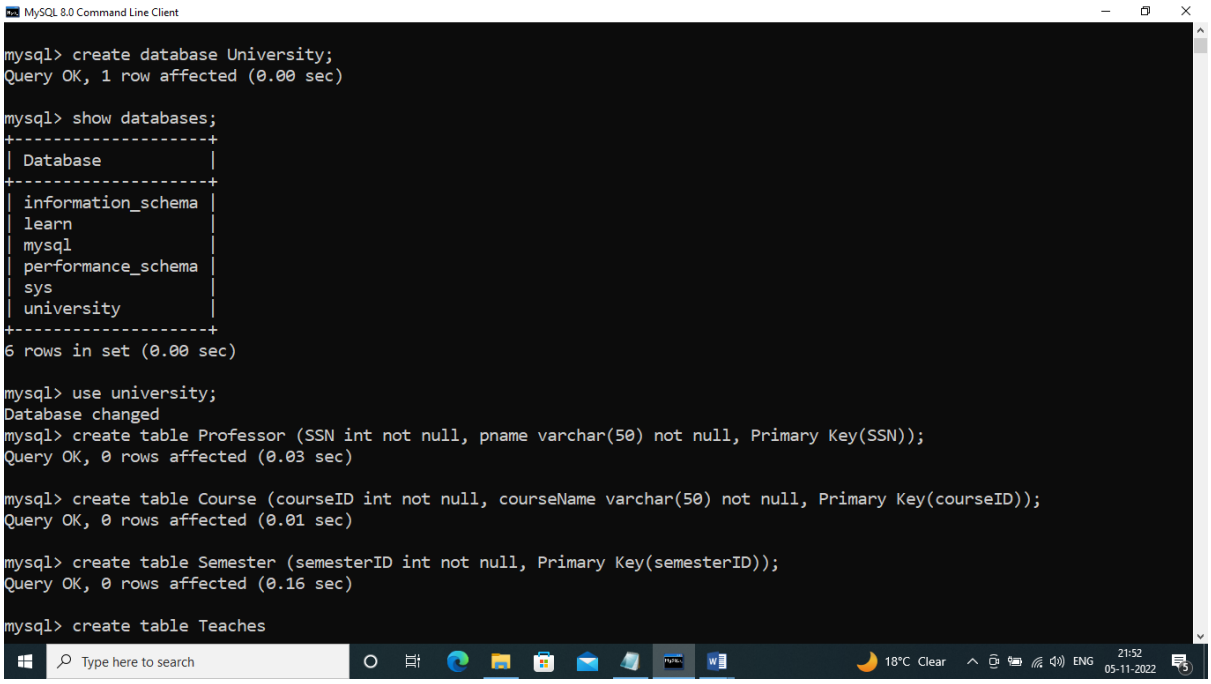
List all candidate keys of the Teaches relationship set.

1. Professors can teach the same course in several semesters, and each offering must be recorded.

   E-R Diagram:



```
mysql> create database University;
mysql> show databases;
mysql> use university;
mysql> create table Professor (SSN int not null, pname varchar(50) not
null, Primary Key(SSN));
mysql> create table Course (courseID int not null, courseName
varchar(50) not null, Primary Key(courseID));
mysql> create table Semester (semesterID int not null, Primary
Key(semesterID));
mysql>create table Teaches
    -> (SSN int not null,
    -> courseID int not null,
    -> semesterID int not null,
    -> Primary Key (SSN, courseID, semesterID),
    -> constraint ssn_prof Foreign Key (SSN) references Professor(SSN)
on delete cascade on update cascade,
    -> constraint courseid_course Foreign Key (courseID) references
Course(courseID) on delete cascade on update cascade,
    -> constraint semid_sem Foreign Key (semesterID) references
Semester(semesterID) on delete cascade on update cascade);
```


MySQL 8.0 Command Line Client
mysql> create database University;
Query OK, 1 row affected (0.00 sec)
mysql> show databases;
+--------------------+
| Database |
+--------------------+
| information_schema |
| learn |
| mysql |
| performance_schema |
| sys |
| university |
+--------------------+
6 rows in set (0.00 sec)
mysql> use university;
Database changed
mysql> create table Professor (SSN int not null, pname varchar(50) not null, Primary Key(SSN));
Query OK, 0 rows affected (0.03 sec)
mysql> create table Course (courseID int not null, courseName varchar(50) not null, Primary Key(courseID));
Query OK, 0 rows affected (0.01 sec)
mysql> create table Semester (semesterID int not null, Primary Key(semesterID));
Query OK, 0 rows affected (0.16 sec)
mysql> create table Teaches
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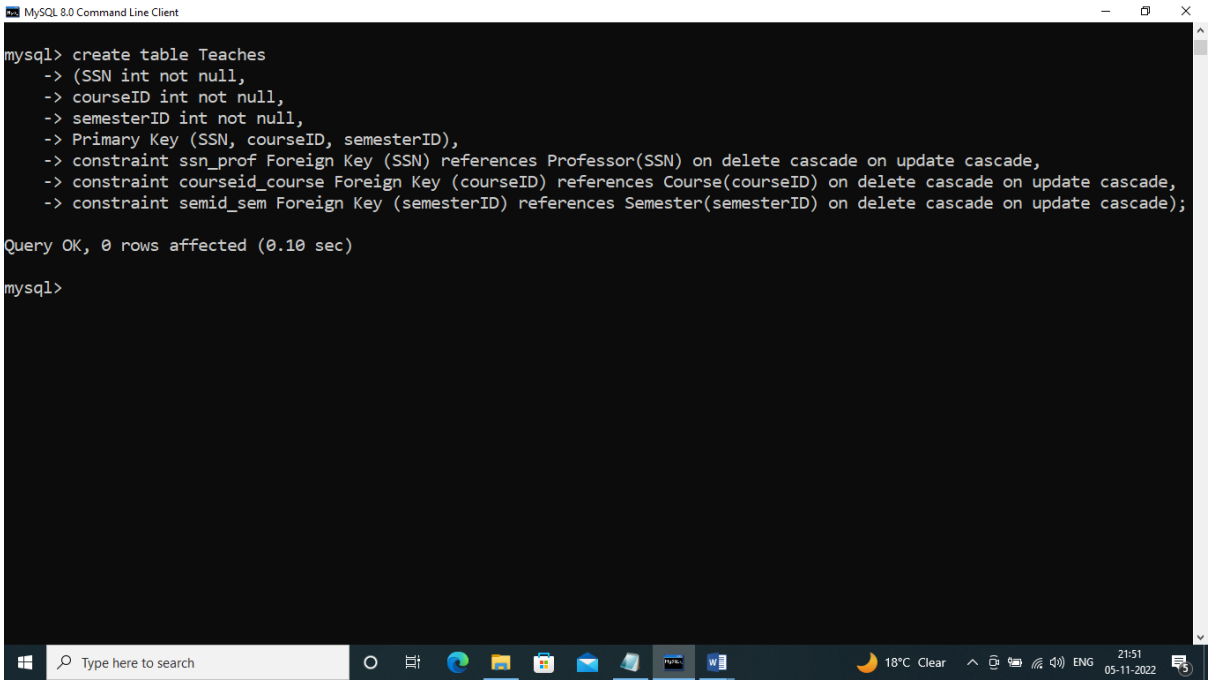
ENG
21:52
05-11-2022


MySQL 8.0 Command Line Client
mysql> create table Teaches
-> (SSN int not null,
-> courseID int not null,
-> semesterID int not null,
-> Primary Key (SSN, courseID, semesterID),
-> constraint ssn_prof Foreign Key (SSN) references Professor(SSN) on delete cascade on update cascade,
-> constraint courseid_course Foreign Key (courseID) references Course(courseID) on delete cascade on update cascade,
-> constraint semid_sem Foreign Key (semesterID) references Semester(semesterID) on delete cascade on update cascade);
Query OK, 0 rows affected (0.10 sec)
mysql>
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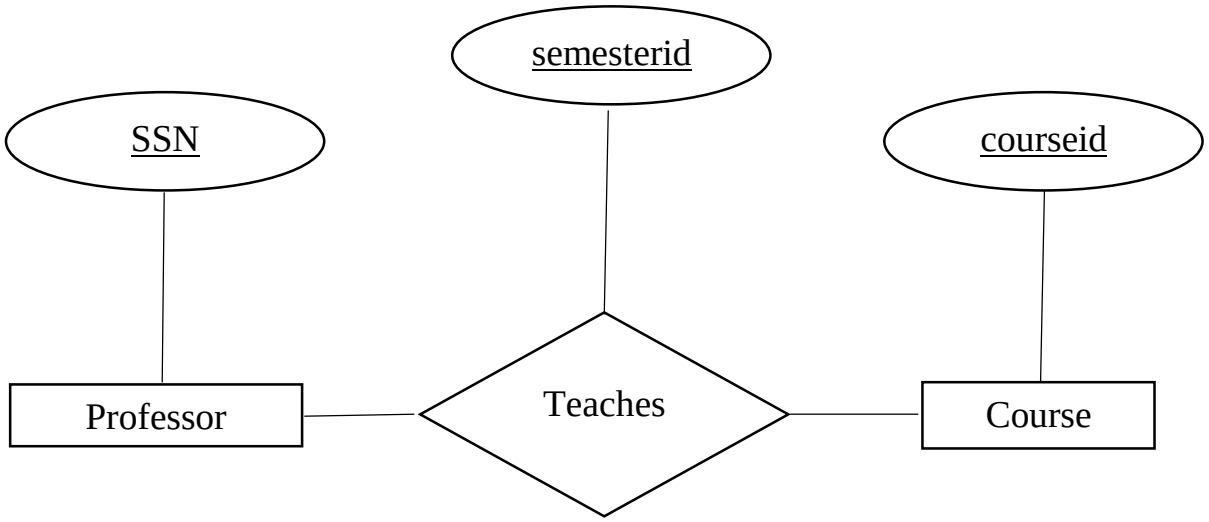
2. Professors can teach the same course in several semesters, but only the most recent such offering needs to be records. Assume the above Situation applies in all subsequent situations.

   E-R Diagram:



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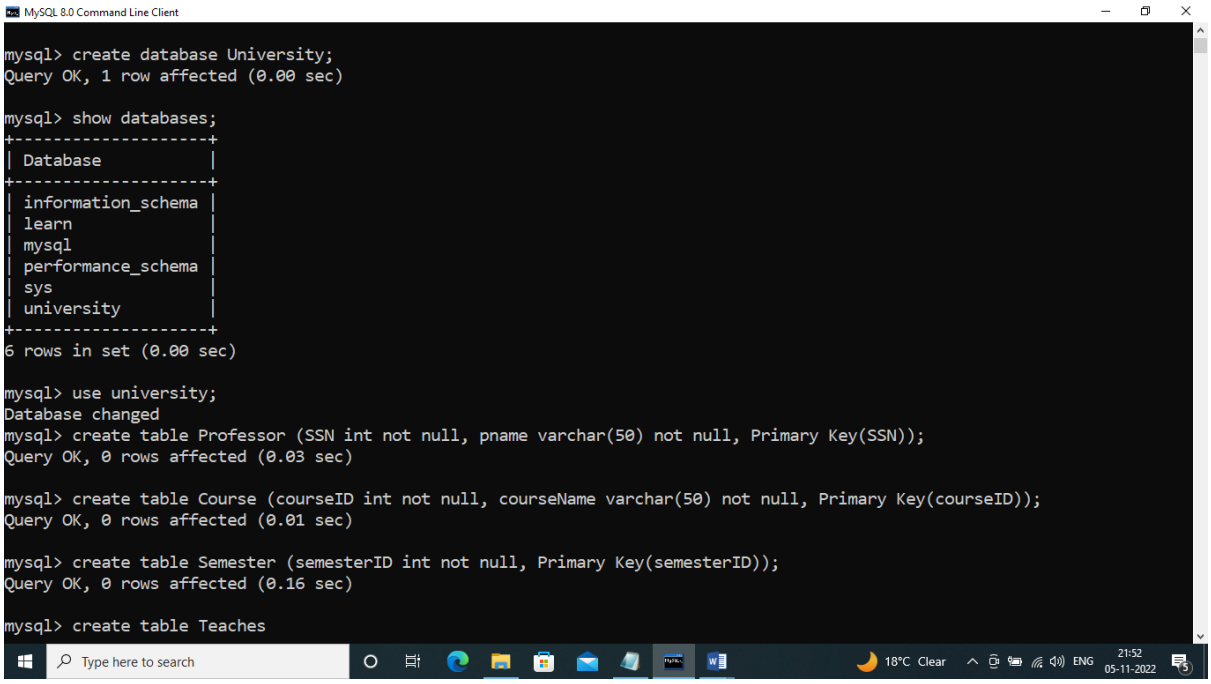
mysql> show databases;
mysql> use university;
mysql> create table Professor (SSN int not null, pname varchar(50) not
null, Primary Key(SSN));
mysql> create table Course (courseID int not null, courseName
varchar(50) not null, Primary Key(courseID));
mysql> create table Semester (semesterID int not null, Primary
Key(semesterID));
mysql> create table Teaches
    -> (SSN int not null,
    -> courseID int not null,
    -> semesterID int not null,
    -> Primary Key (SSN, courseID),
    -> constraint ssn_prof Foreign Key (SSN) references Professor(SSN)
on delete cascade on update cascade,
    -> constraint courseid_course Foreign Key (courseID) references
Course(courseID) on delete cascade on update cascade);
```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+--------------------+
| Database |
+--------------------+
| information_schema |
| learn |
| mysql |
| performance_schema |
| sys |
| university |
+--------------------+
6 rows in set (0.00 sec)
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Database changed
mysql> create table Professor (SSN int not null, pname varchar(50) not null, Primary Key(SSN));
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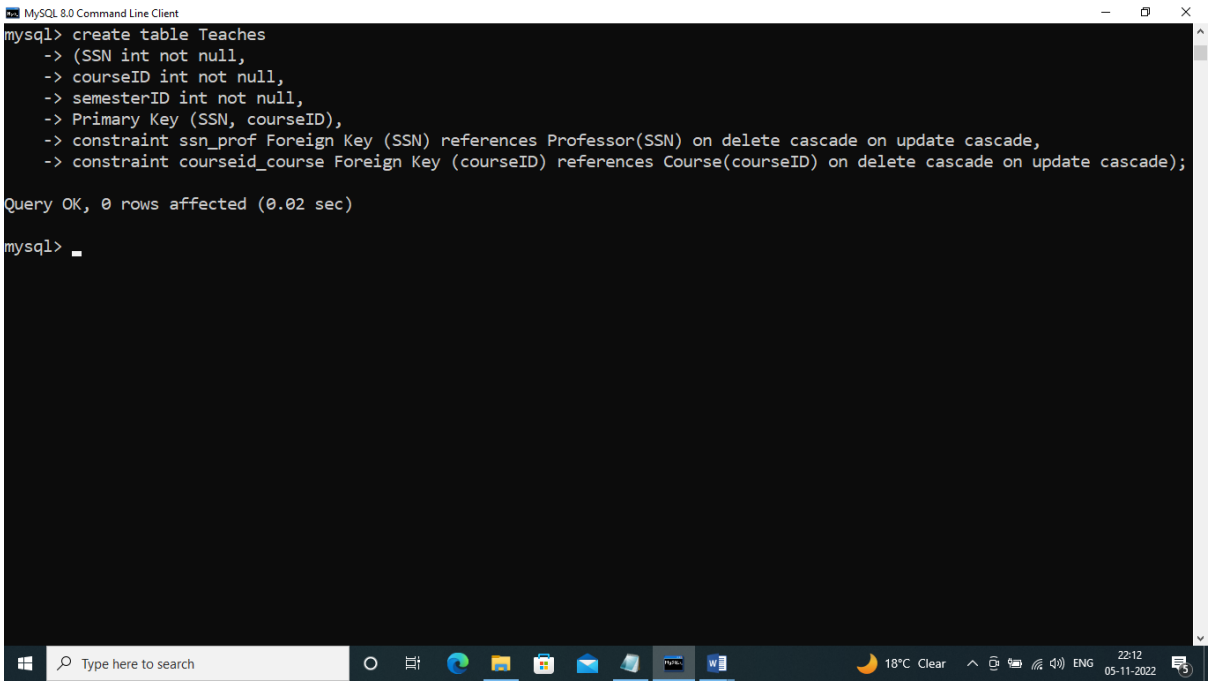
MySQL 8.0 Command Line Client
mysql> create table Teaches
-> (SSN int not null,
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-> semesterID int not null,
-> Primary Key (SSN, courseID),
-> constraint ssn_prof Foreign Key (SSN) references Professor(SSN) on delete cascade on update cascade,
-> constraint courseid_course Foreign Key (courseID) references Course(courseID) on delete cascade on update cascade);
Query OK, 0 rows affected (0.02 sec)
mysql>
Type here to search
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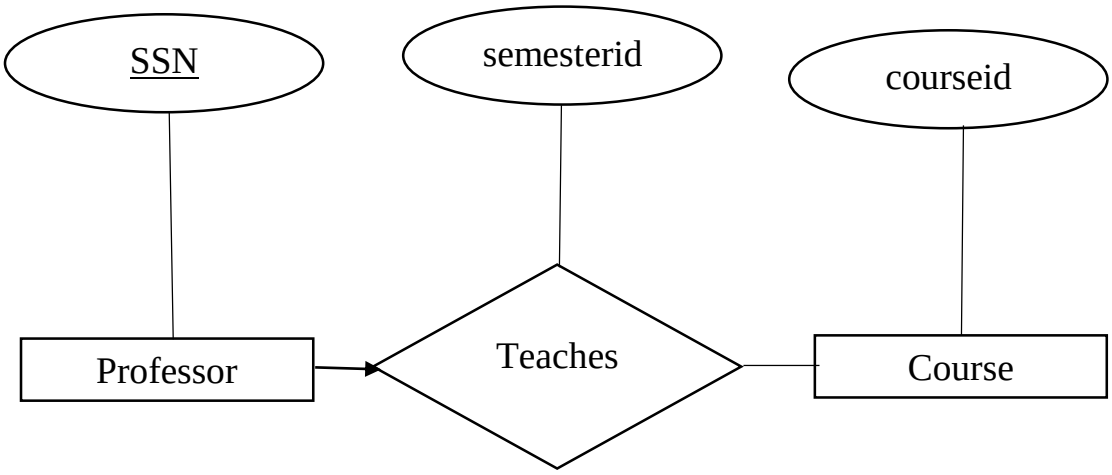
List all the keys possible in each of the following situations.

1. Every professor teaches a course, and every course is taught by some professor.

   E-R Diagram:



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mysql> create table Course (courseID int not null, courseName
varchar(50) not null, Primary Key(courseID));
mysql> create table Semester (semesterID int not null, Primary
Key(semesterID));
mysql> create table Professor_teaches
    -> (SSN int not null,
    -> courseID int not null,
    -> semesterID int not null,
    -> Primary Key (SSN),
    -> constraint courseid_course Foreign Key (courseID) references
Course(courseID) on delete cascade on update cascade);
```

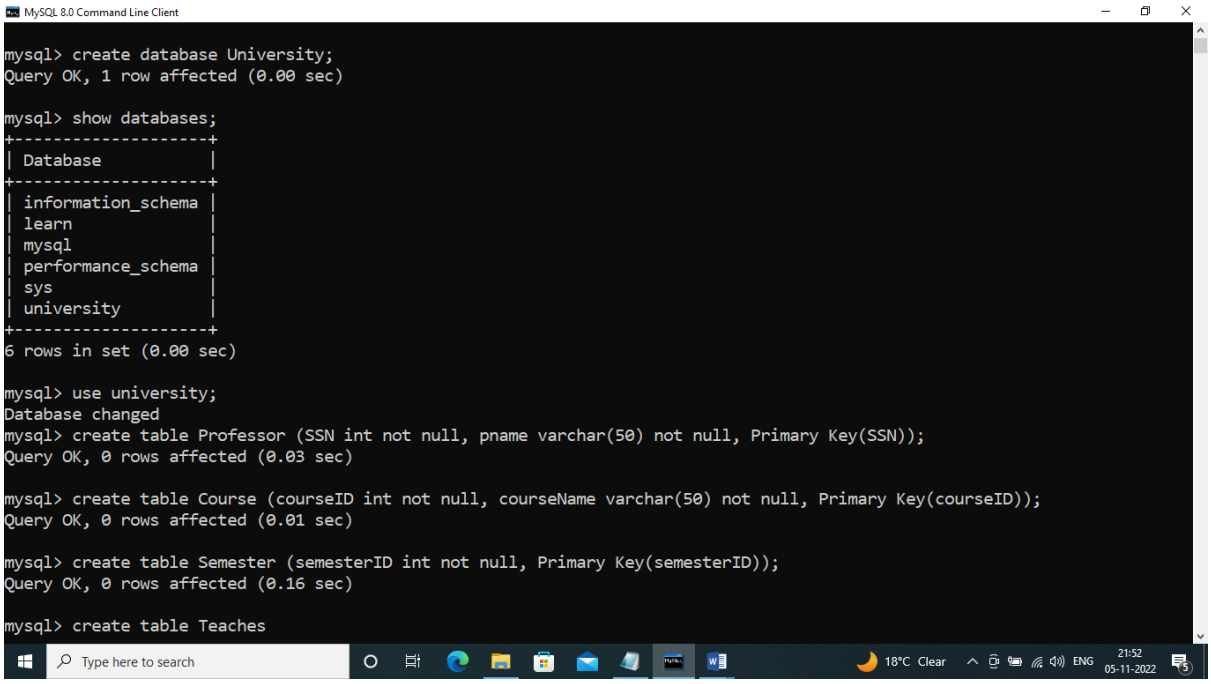
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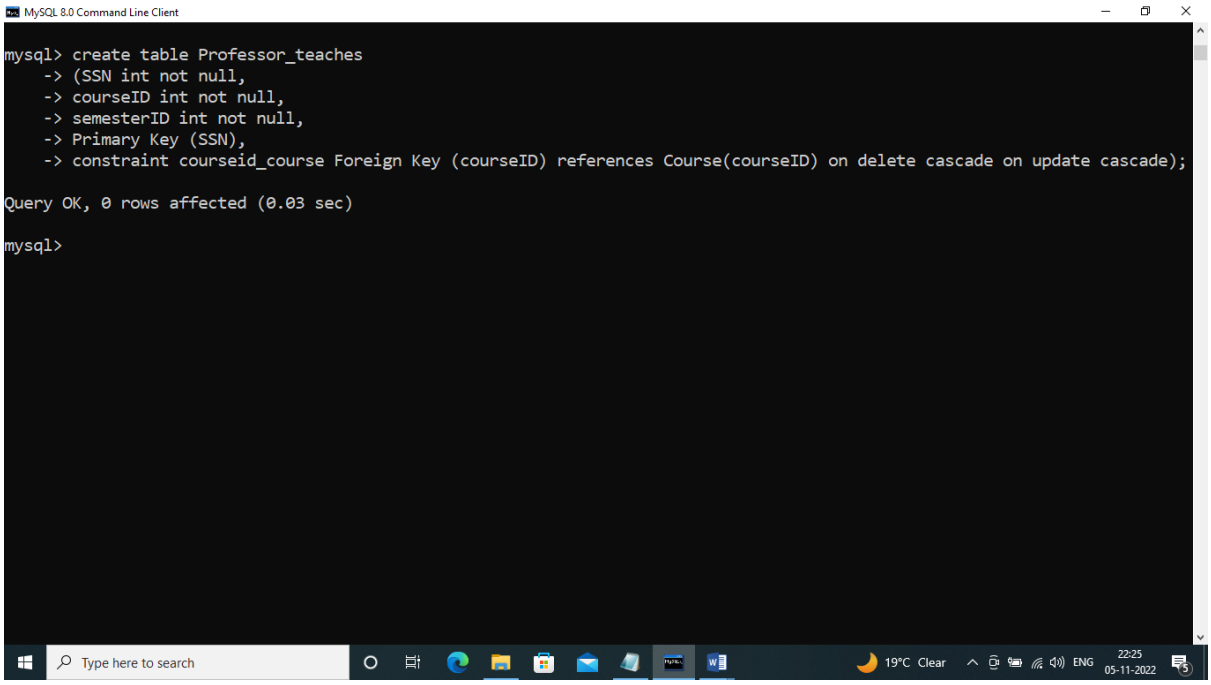
MySQL 8.0 Command Line Client
mysql> create table Professor_teaches
-> (SSN int not null,
-> courseID int not null,
-> semesterID int not null,
-> Primary Key (SSN),
-> constraint courseid_course Foreign Key (courseID) references Course(courseID) on delete cascade on update cascade);
Query OK, 0 rows affected (0.03 sec)
mysql>
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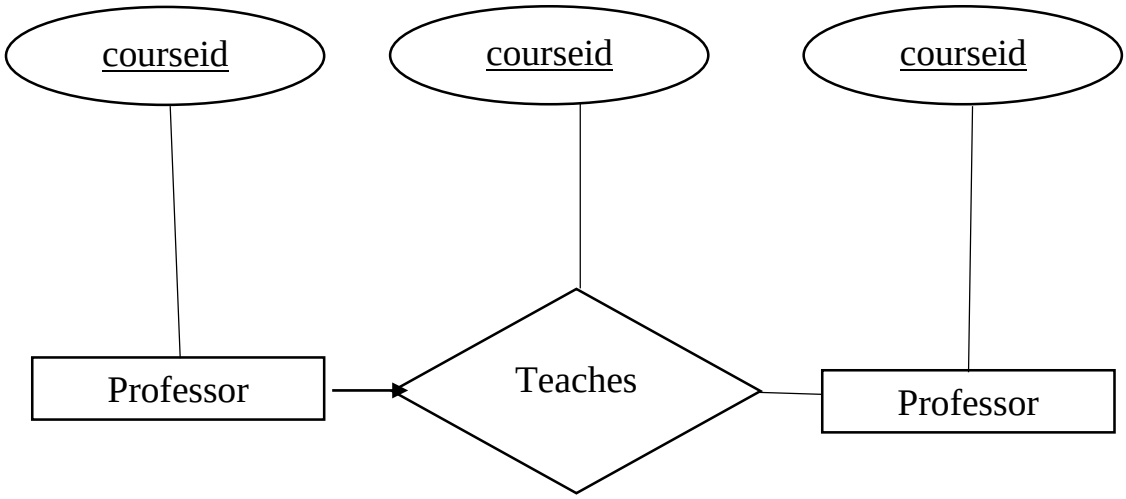
2. Every professor teaches exactly one course, and every course is taught by exactly one professor.

   E-R Diagram:



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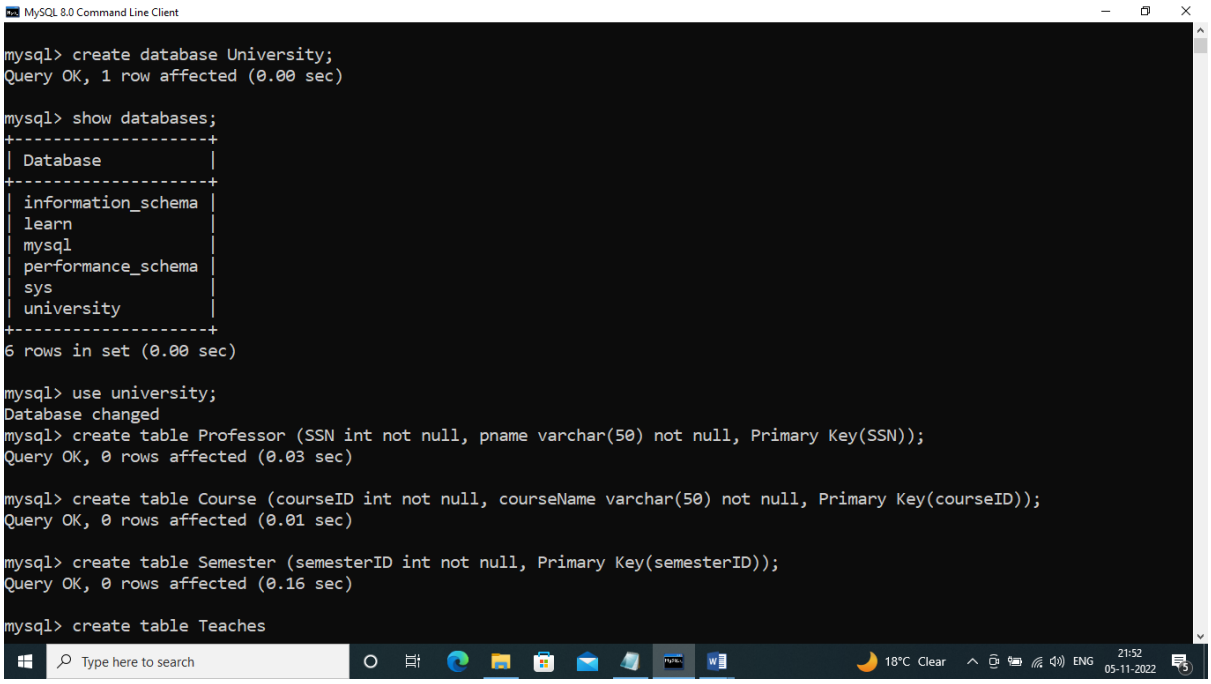
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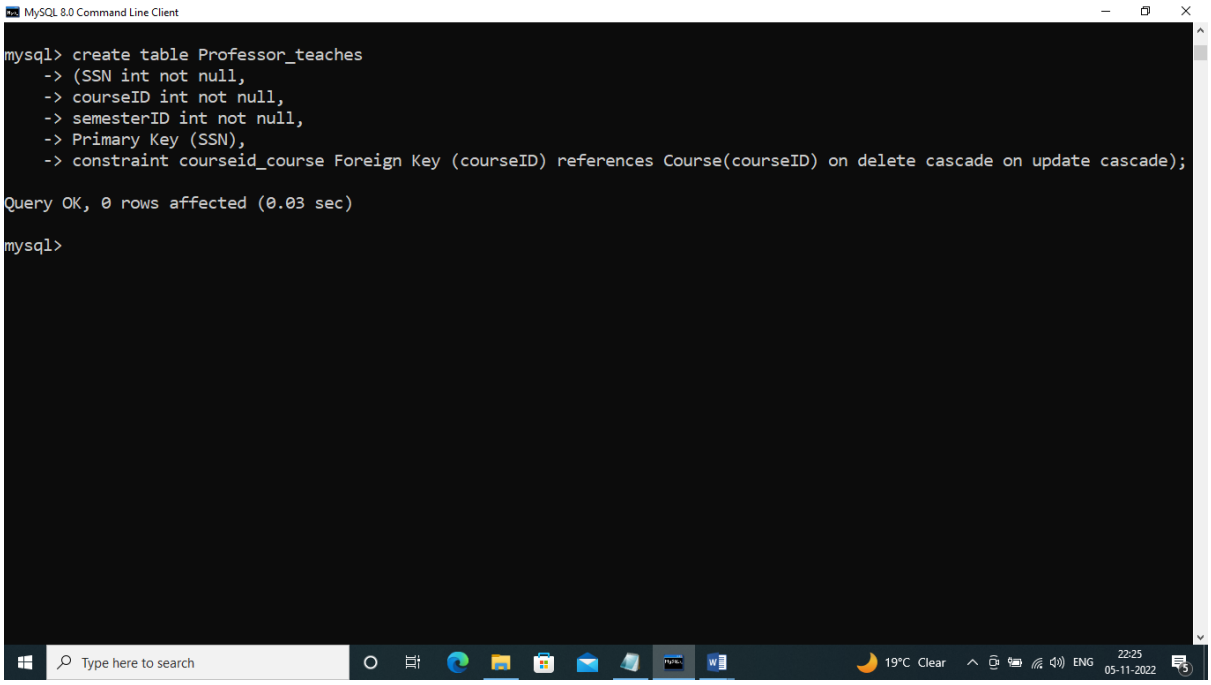
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Query OK, 0 rows affected (0.03 sec)
mysql>
Type here to search
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ENG
22:25
05-11-2022